iD H250 / H500

Service manual

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BARCO

Visibly yours

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Introduction to the user :

If this equipment does cause interference to radio or television reception, the user may try to correct the interference by one or more of the following measures :

- Re-orientation of the receiving antenna for the radio or television.
- Relocate the equipment with respect to the receiver.
- Plug the equipment into a different outlet so that the equipment and receiver are on different branch circuits.
- Fasten cables connectors to the equipment by mounting screws.

The use of shielded cables is required to comply within the limits of Part 15 of FCC rules and EN55022.

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The environmental conditions as well as the servicing and maintenance regulations specified in the this manual must be complied with by the customer.

TABLE OF CONTENTS

1. Safety 3
1.1 Safety Instructions 3

2. General information 7
2.1 Conventions 7
2.2 Abbreviations 8
2.3 Connector Instructions 8
2.4 Removing the cable basket 11
2.5 Removing the lens 12
2.6 Mounting the lens 13
2.7 Removing the rear cover 13
2.8 Removing the top cover 14
2.9 Spares overview 16

3. Software 19
3.1 Description of the software 19
3.2 Upgrading the software 19

4. Board and component location 21
4.1 Board location 21
4.2 Component location 23
4.3 Remote control unit 26

5. Electronic spares and servicing procedures 27
5.1 Introduction 27
5.2 Interconnection diagram 29
5.3 Lamp cover removal 29
5.4 The input module 31
5.4.1 Description of the input module 31
5.4.2 Removing the input module 32
5.4.3 Disassembling the input module 33
5.4.3.1 The backplane 34
5.4.3.1.1 Description of the backplane 34
5.4.3.1.2 Replacing the backplane 34
5.4.3.2 The DVI input 35
5.4.3.3 The RGB and Video input 35
5.4.3.3.1 Description of the RGB / Video input 35
5.4.3.3.2 Replacing the RGB / Video input 36
5.4.3.4 The DVI and D15 input 38
5.4.3.4.1 Description of the DVI / D15 input 38
5.4.3.4.2 Replacing the DVI / D15 input 39
5.4.3.5 The SDI / HDSDI input (optional) 40
5.4.3.5.1 Description of the SDI / HDSDI input 40
5.4.3.5.2 Installing the SDI / HDSDI input 40
5.4.3.6 The ethernet board 41
5.4.3.6.1 Description of the ethernet board 41
5.4.3.6.2 Network settings 41
5.4.3.6.3 Diagnostics of the ethernet board 42
5.4.3.6.4 Replacing the ethernet board 42
5.5 The pixel map processor (PMP) 43
5.5.1 Description of the PMP 44
5.5.2 Diagnostics of the PMP 45
5.5.3 Removing the PMP 47
5.6 The formatter 48
5.6.1 Description of the formatter 48
5.6.2 Replacing the formatter 49
5.7 The power box 50
5.7.1 Description 50
5.7.2 Diagnostic LED's 53
5.7.3 Replacing the power box 54
5.8 The lamp power supply 59
5.8.1 Description 59
5.8.2 Replacing the lamp power supply 59
5.8.3 Replacing the lamp filter 62

6. Optical spares and servicing procedures 65
6.1 Introduction 65
6.2 The UHP lamp 67
6.3 The UV/IR filter 69
6.4 The DLP chip 70
6.4.1 DLP / formatter mounting system 70
6.4.2 Replacing the DLP chip 71
6.5 The folding mirror 72

6.5.1 Description of the folding mirror 72
6.5.2 Removing the folding mirror 73
6.5.3 Adjusting the folding mirror 73
6.6 The aspheric lens 75
6.6.1 Description of the aspheric lens 75
6.6.2 Adjusting the aspheric lens 76
6.7 The light rod 77
6.7.1 Description of the light rod 77
6.7.2 Alignment of the light rod 77

7. Mechanical spares and servicing procedures 81
7.1 The color wheel and sensor 81
7.1.1 Description 81
7.1.2 Replacing the color wheel 82
7.1.3 Color Wheel Index 84
7.1.4 Replacing the color wheel sensor 85
7.1.5 Replacing the color wheel connection board 85
7.2 The lens shift motor 86
7.3 Fans and temperature sensors 88
7.3.1 Fans 88
7.3.2 Replacing the lamp fans 92
7.3.3 Replacing the lamp top fans 92
7.3.4 Replacing the power box fan 93
7.3.5 Removing the LPS fan 93
7.3.6 Replacing the light pipe fan 94
7.3.7 Replacing the DMD fan 96
7.3.8 Replacing the PMP fan 97
7.3.9 Temperature sensors 97
7.4 The lens holder 99
7.4.1 Removing the lens holder 99
7.5 Dust filters 104

1. SAFETY

Overview

- Safety Instructions

1.1 Safety Instructions

WARNING: Before Removing/Replacing any projector components, turn off the Main Power Switch and unplug the Main AC power cable.

Safety Instructions

1. Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:
   a) Be sure that no built-in protective devices are defective and/or have been defeated during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, insulating materials, barriers, covers/shields, and isolation resistor/capacitor networks. Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damage.
   b) Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, (1) excessively wide cabinet ventilation slots, and (2) an improperly fitted and/or incorrectly secured cover panels.
   c) Leakage Current Hot Check. With the instrument completely reassembled, plug the AC line cord directly into a 220 V AC outlet (Do not use an isolation transformer during this test). Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.0 Leakage Current for Appliances and Underwriters Laboratories (UL) 1410, (50.7). With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screwheads, metallic overlays, control shafts, etc.). especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 1.5 mA. Reverse the instrument power cord plug in the outlet and repeat test. ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR BEFORE CONNECTING ACCESSORIES.

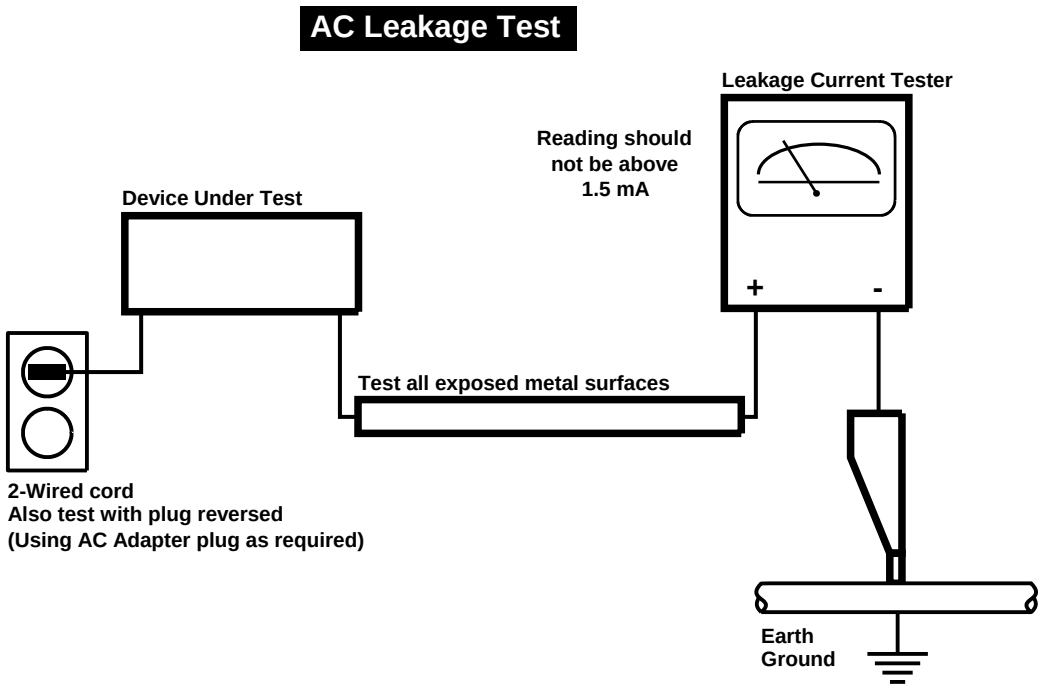


Image 1-1
AC Leakage Test

   d) Ultraviolet Radiation exposure - Warning: This lamp can cause serious skin burn and eye inflammation from shortwave ultraviolet radiation if not operated in enclosed fixtures. DO NOT operate this lamp in a fixture with a missing or broken lens cover.
   e) Ozone: Operating lamp generates ozone gas which is harmful to the respiratory system. Therefore the lamp should be operated in adequately ventilated equipment.
2. Read and comply with all caution and safety-related notes on or inside the projector cabinet or on the projector chassis, or on the picture tube.
3. Design Alteration Warning - Do not alter or add to the mechanical or electrical design of this apparatus. Design alterations and additions, including, but not limited to, circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this apparatus and create a hazard to the user. Any design alterations or additions may void the manufacturer's warranty and may make you, the servicer responsible for personal injury or property damage resulting therefrom.
4. Lamp explosion Protection Warning – The lamp in this projector operates with a high internal pressure and there is a slight risk that the lamp may explode, particularly if it is used beyond its rated life. Do not remove, install, or otherwise handle the lamp in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while lamps are handled. Keep the lamp away from your body. For continued explosion protection, replace the lamp only with one of the same type number. Always replace the lamp before the rated life time.

5. Hot Chassis Warning - This projector chassis has two ground systems: the primary ground system is formed by the negative voltage of the rectified mains (power) and is only used as a reference in primary circuits; the secondary ground system is connected to earth ground via the earth conductor in the mains (power) lead. Separation between primary and secondary circuits is performed by the safety isolation transformers. Components bridging this transformers are also safety components and must never be defeated or altercated. All user-accessible conductive parts must be connected to earth ground, or are kept at SELV (Safety Extra Low Voltage).
6. Observe original lead dress. Always inspect in all areas for pinched, out-of-face, or frayed wiring. Do not change spacing between components, and between components and the printed-circuit board. Check AC power cord for damage. Take extra care to assure correct lead dress in the following areas:
   a) near sharp edges
   b) near thermally hot parts - be sure that leads and components do not touch thermally hot parts
   c) the AC supply
   d) high voltage
7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.
8. PRODUCT SAFETY NOTICE - Many electrical and mechanical parts have special safety-related characteristics some of which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part in BARCO service data parts list might create shock, fire, and/or other hazards. Product Safety is under review continuously and new instructions are issued whenever appropriate. For the latest information, always consult the appropriate current BARCO service literature.
9. Do not spray chemical on or near this instrument or any of its assemblies.
10. Electrostatically Sensitive (ES) Devices Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity:
    a) Immediately before handling any semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Wear a commercially available high impedance discharging wrist strap device.
    b) After removing an electrical assembly equipped with ES devices, place the assembly on a static dissipative surface such as a 3M No 8210 table mat, to prevent electrostatic charge buildup or exposure of the assembly.
    c) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
    d) Do not remove a replacement ES device from its protective package until immediately before you are ready to install it (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminium foil or comparable conductive material).
    e) Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed. CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
    f) Minimize bodily motions when handling unpacked replacement ES devices (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

2. GENERAL INFORMATION

Overview

- Conventions
- Abbreviations
- Connector Instructions
- Removing the cable basket
- Removing the lens
- Mounting the lens
- Removing the rear cover
- Removing the top cover
- Spares overview

About this manual

This manual describes iD H250 and iD H500. The main difference between both is the use of a RGBRGB color wheel in the iD H250 and the use of a RGBW color wheel in the iD H500.

Some of the images may be slightly different from your projector, but this does not affect any of the procedures described below!

2.1 Conventions

Projector orientation

In the following procedures, references to location (left, right, front, rear, top, bottom) on the projector are made as shown in the following image.

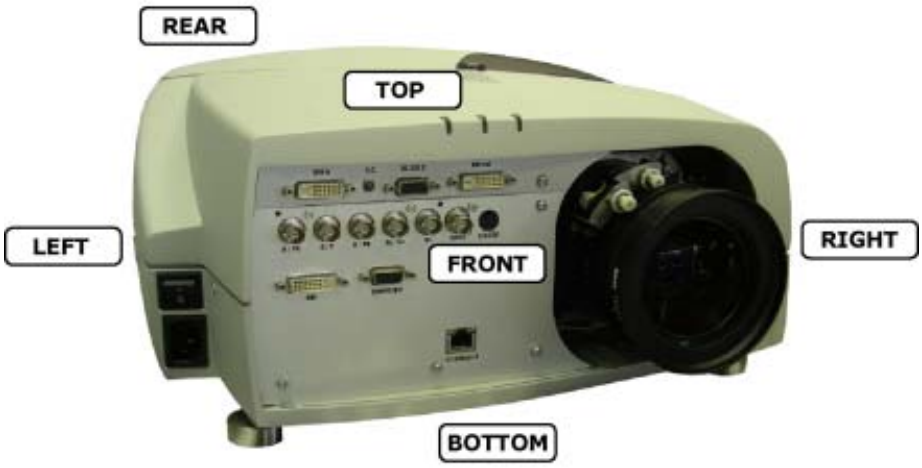


Image 2-1
Projector orientation

Spare abbreviations

Each available spare is indicated with one of the following abbreviations.

Abbreviation	Description
NR	non repairable
CO	consumable

Abbreviation	Description
FR	factory repairable
LR	locally repairable

2.2 Abbreviations

Abbreviations

LPS	lamp power supply
SMPS	switched mode power supply
PB	power box
PFC	power factor corrector
PMP	pixel map processor
DLP™	digital light processor
UHP	ultra high pressure
CW	color wheel
LVDS	low voltage differential signal
SBC	single board computer
DMD	digital micro mirror device
DVI	digital visual interface
SDI	serial digital interface

2.3 Connector Instructions

When needed, remove cable straps to easily disconnect a connector, when finished always replace with new cable straps and tie up the cables to their initial position.

WARNING: Always respect the ES (Electrostatically Sensitive) Instructions .

Do not use any kind of tools when disconnecting a connector.

Board To Board Connector

- Board To Board Connectors are mounted directly on the Board, do not use any tools when disconnecting these connectors.
- To disconnecting carefully lift the board on top.

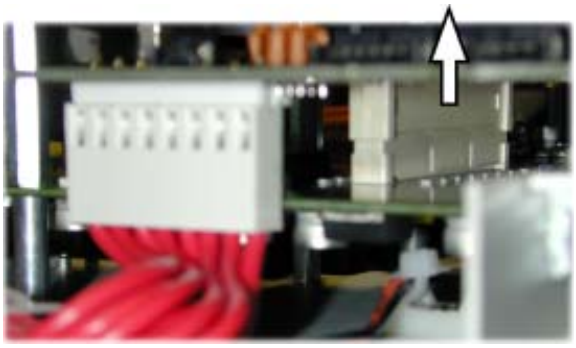


Image 2-2
Disconnect by carefully lifting the board on top

Flat Cable Connector

- Do not use any tools when (dis)connecting a flat cable connector, otherwise damage may occur on the mini locks.
- Disconnect by simultaneously pulling out the 2 mini locks on both sides of the flat cable connector.

Image 2-3
Pull out the 2 mini locks on both sides of the flat cable connector

- Do not touch the contacts of the flat cable when removing/inserting the flat cable otherwise damage may occur by oxidation of these contacts.

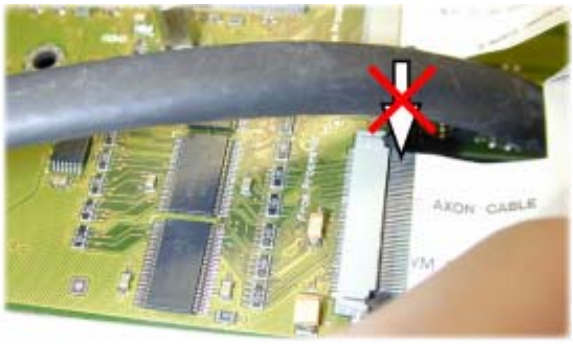


Image 2-4
Do not touch the contacts of the flat cable

- Do not bend the flat cable, otherwise internal cable damage may occur.
- Insert the flat cable in a straight way into the flat cable connector.

Image 2-5
Insert the flat cable in a straight way

- Connect the flat cable by simultaneously pushing the mini locks on both sides of the flat cable connector.

ATX connector

- To disconnect an ATX connector, push on the lip as shown in the image.

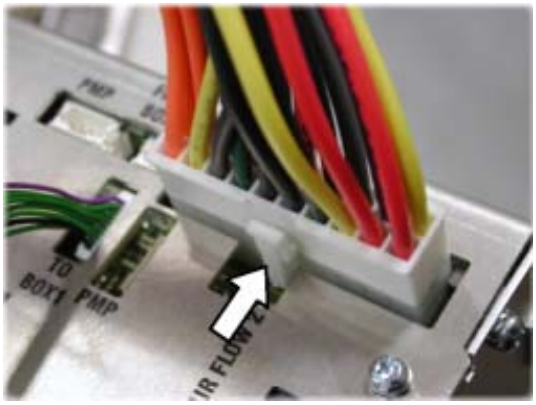


Image 2-6

Lamp power connector

- These connectors are used to connect the Lamp drivers to the Power box.
- To disconnect, push on both lips as shown in the image.

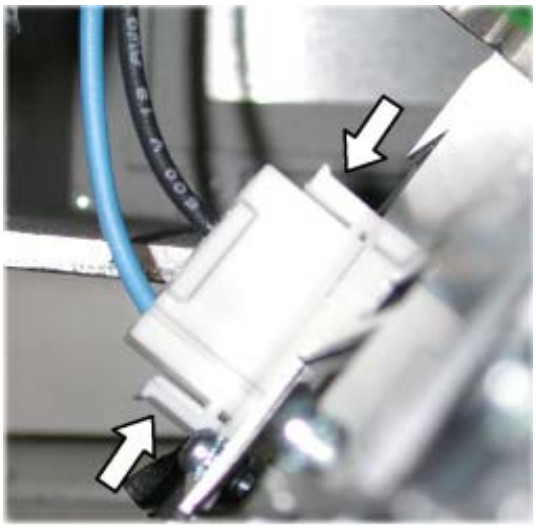


Image 2-7

2.4 Removing the cable basket

Necessary tools

No tools.

How to remove the cable basket?

1. Slightly push downwards the middle top of the cable basket to unlock the upper part.
2. Pull the cable basket out of it bottom lock.

Image 2-8

2.5 Removing the lens

Necessary tools

No tools.

How to remove the lens?

1. Support the lens with one hand.
2. Unlock the lens by pulling the handle which is located on the right side of the projector.
3. Pull the lens out of the lens holder.

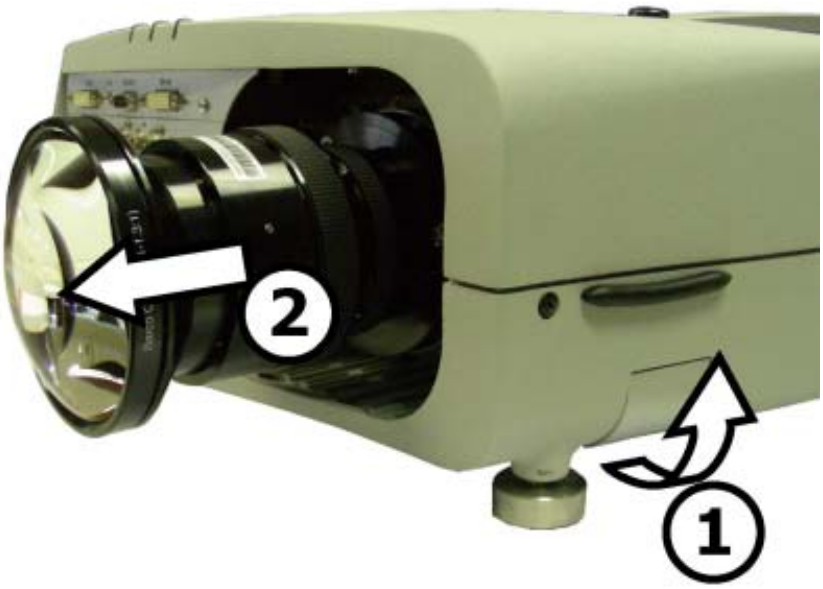


Image 2-9
removal of the lens

CAUTION: Never transport the projector with the lens mounted on it! Always remove the lens before transporting the projector.

2.6 Mounting the lens

Necessary tools

No tools.

How to mount the lens?

1. Make sure the lens locking handle is not pulled out
2. Gently push the lens into the lens holder until it is locked (click!)

Caution: *When the projector is not fixed onto its support, hold it back while pushing in the lens, to avoid shifting the projector.*

Caution: *When a motorized lens is used, be careful not to damage the connection jig in the lens holder (left top side). Make sure the lens is positioned well before pushing it into its lock.*

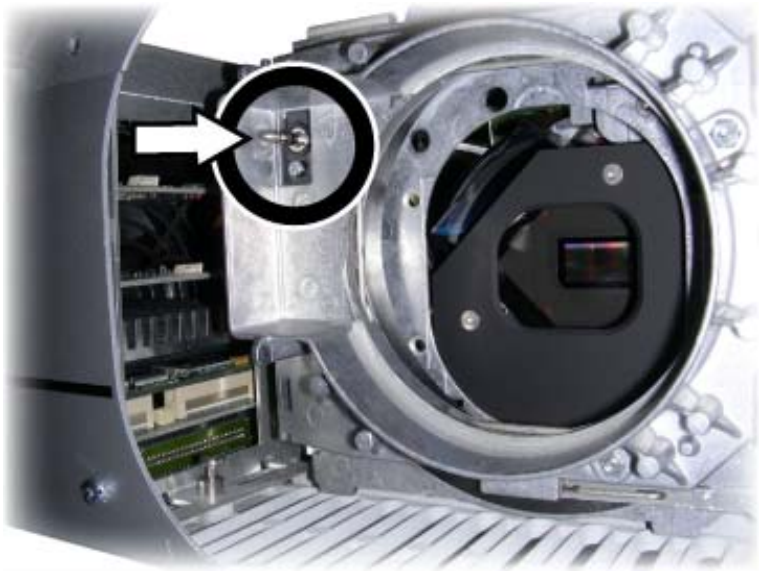


Image 2-10
Lensholder jig

2.7 Removing the rear cover

Necessary tools

slot 10mm screwdriver

WARNING: Risk of burns: respect the cooling down time of the projector before starting any replacement procedures!

WARNING: Risk of electrical shock: before starting the replacement procedures, power down the projector and unplug the power cord from the wall outlet!

How to remove the back cover?

1. Use a screwdriver to turn the rear cover lock screw a quarter turn counterclockwise.

Image 2-11
Rear cover fixing screw

2. Tilt the rear cover and remove it.

Image 2-12
Tilt rear cover to remove it

2.8 Removing the top cover

Necessary tools

Phillips N° 2 screwdriver

How to remove the top cover?

1. Loosen and remove the screws A (3pc) and B (2pc) retaining the top cover)

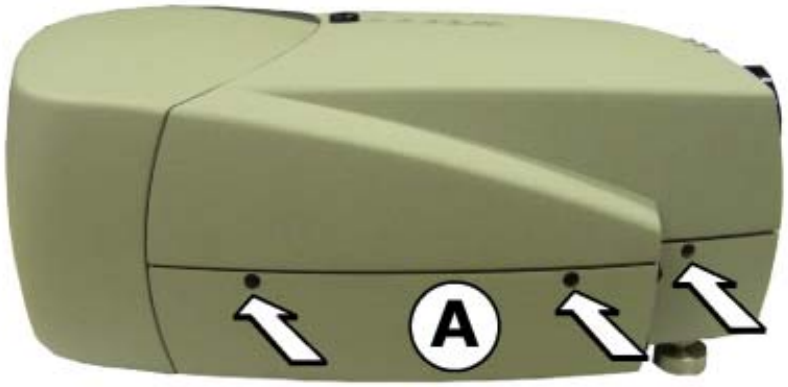


Image 2-13
remove the 3 screws on the left

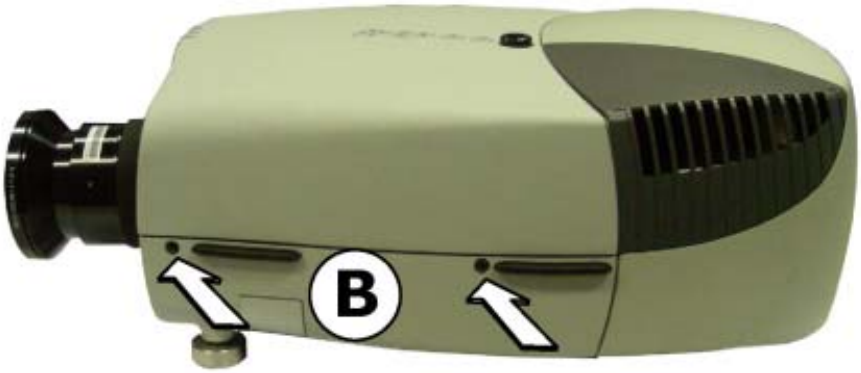


Image 2-14
remove the 2 screws on the right

2. Unplug the connector on the keypad / IR receiver

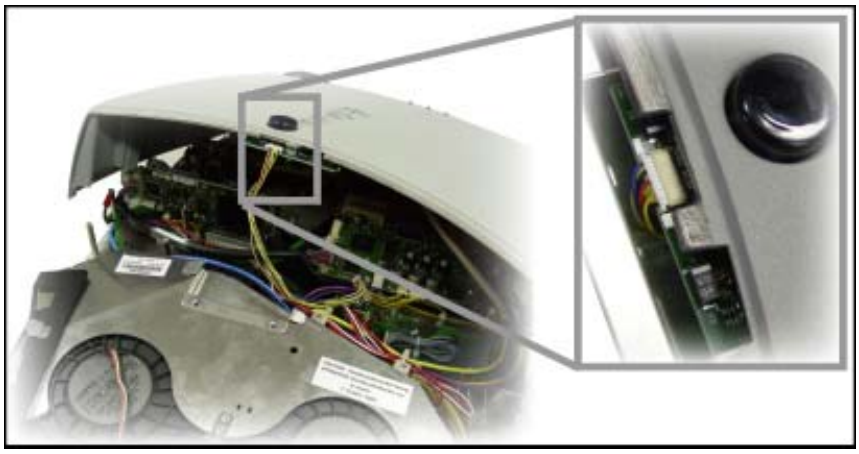


Image 2-15
Unplug the touchpad/IR connector

3. Remove the top cover
   Note: *Unplugging the IR receiver will not interrupt the IR communication with the RCU since an additional IR receiver is mounted on the PMP board.*

2.9 Spares overview

Consumables overview

Description	Category	Ordernumber
UV filter	CO	R842894K
1 lamp	CO	R9841826
Set of 2 lamps	CO	R9841827

Recommended spares

Description	Category	Order number
LPS driver	FR	B400968K
RGB input	FR	R764499K
DVI input	FR	R7640917K
Formatter	FR	R765020K
Temperature sensor ambient	NR	R764525K
PMP	FR	R765024K
power box	FR	R852585K

Non recommended spares

Description	Category	Order number
Remote control unit (RCU)	NR	R763794K
DLP interposer	NR	B401234K
Color wheel sensor	NR	R764840K
DMD temperature sensor	NR	R765064K
Color wheel connection	NR	R765034K
Color wheel RGBRGB (iD H250)	NR	R8526282K

Description	Category	Order number
Color wheel RGWB (iD H500)	NR	R852628K
LPS filter	NR	R764665K
Back plane	FR	R765023K
DMD	NR	B401216K
Infitec switcher left	NR	R854872K
Infitec switcher right	NR	R854873K

Covers

Description	Category	Order number
Top cover	NR	R8454271K
Rear cover	NR	R826078K

Fans

Description	Category	Order number
Lamp top fan	NR	B32464892D
Main lamp fan	NR	B3246759D
Power box fan	NR	B32455192D
LPS fan	NR	
DMD fan	NR	B32458892D
Light rod and color wheel fan	NR	B3246611DK
PMP fan	NR	

Motors

Description	Category	Order number
Lens shift motor	NR	B3580101K

3. SOFTWARE

The software is also referred to as firmware.

3.1 Description of the software

Firmware

The firmware is the software that controls the projector. It is stored on the PMP.

3.2 Upgrading the software

The software is also referred to as firmware.

How to upgrade the software, using a fixed IP address?

1. download the upgrade file onto your computer or laptop
2. set the correct parameters for the network connection in the projector. See section: *Ethernet board.*
   - check *Use Fixed IP*
   - you can change the IP address of the projector if needed
3. set the IP address and subnet mask of your computer to the same range as the IP address and subnet mask of the projector
4. connect the projector to your computer, using a crossed network cable (NULL modem)
5. run the executable upgrade file on your computer
   - you will be asked to enter the IP address of the projector
   - the upgrade will start: follow the instructions

   Tip: *The IP address of the projector can be found in the OSD: Installation > Network Settings...*

How to upgrade the software, using a variable IP address?

1. download the upgrade file onto a computer or laptop connected to the LAN (with DHCP-server)
2. set the correct parameters for the network connection in the projector. See section: *Ethernet board.*
   - check *Use DHCP*
   - a host name can be choosen
   - changing the IP address of the projector will not be possible
3. connect the projector to your LAN (with DHCP server), using a straight network cable
4. run the executable upgrade file on your computer
   - you will be asked to enter the IP address of the projector
   - the upgrade will start: follow the instructions

   Tip: *The IP address of the projector can be found in the OSD: Installation > Network Settings...*

4. BOARD AND COMPONENT LOCATION

4.1 Board location

Front left view

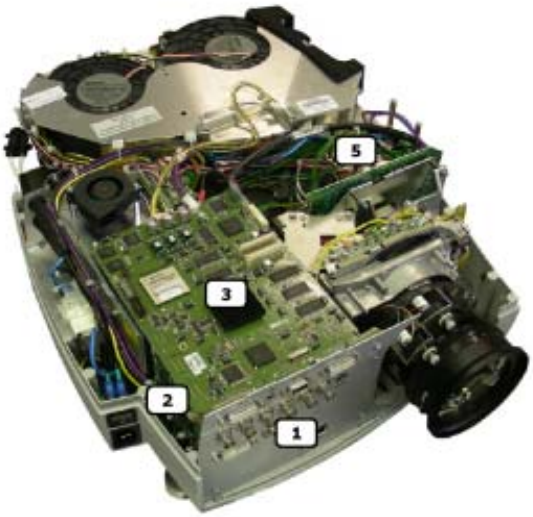


Image 4-1
Left front view of the projector (the server on the image is replaced by a network layer in the iD H400)

Indication	Description	Part number
1	Input module	contains several boards
2	Backplane	R765023
3	PMP (pixel map processor)	R765024K
5	LPS driver	B400968K

Left top view

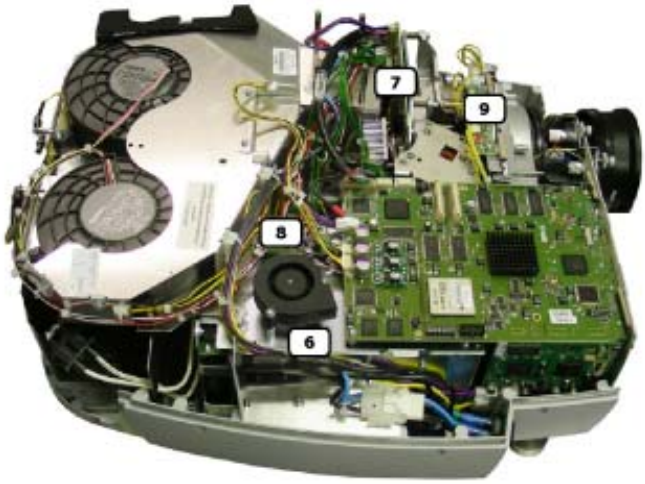


Image 4-2
Left top view of the projector

Indication	Description	Part number
6	Power box	R852585K
7	Formatter	R765020K
8	Fan connector board	R764395
9	Motor connector board	R763592

Top cover view

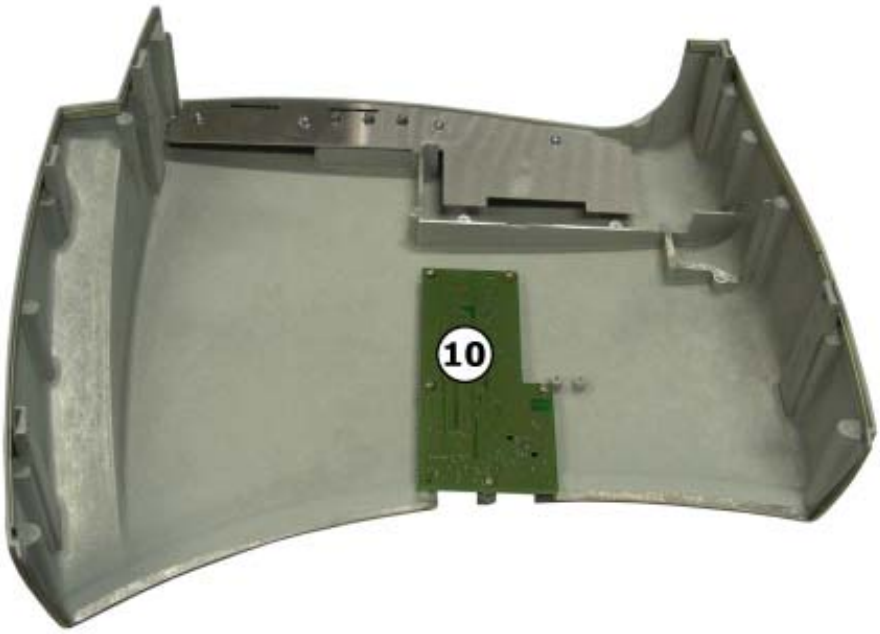


Image 4-3
Top cover: view of the inside

Indication	Description	Part number
10	Infra red and touch pad board	R763579

4.2 Component location

Right top view

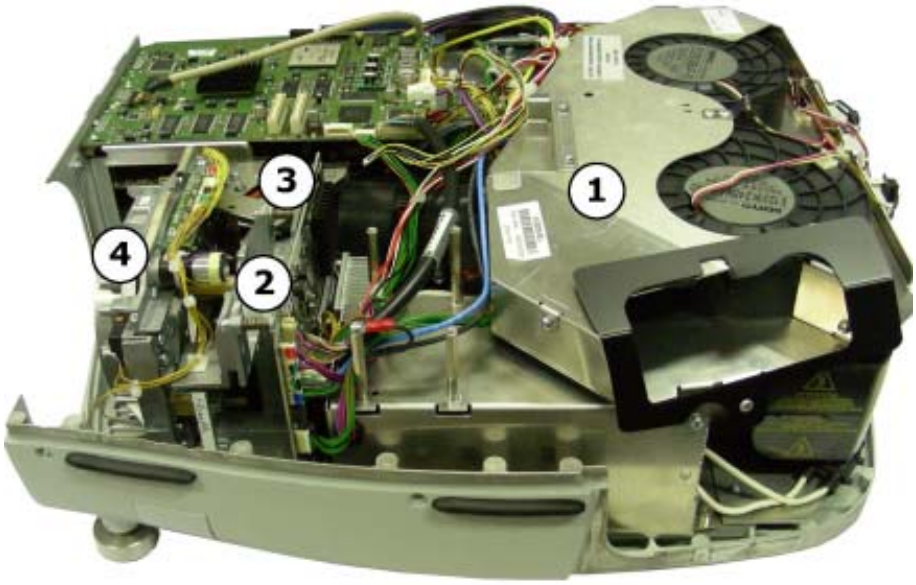


Image 4-4
Right top view of the projector

Indication	Description	Part number
1	Lamp cover (outlet)	-
2	Engine frame (TIR prism location)	-
3	Folding mirror	-
4	Lens holder	-

Rear view

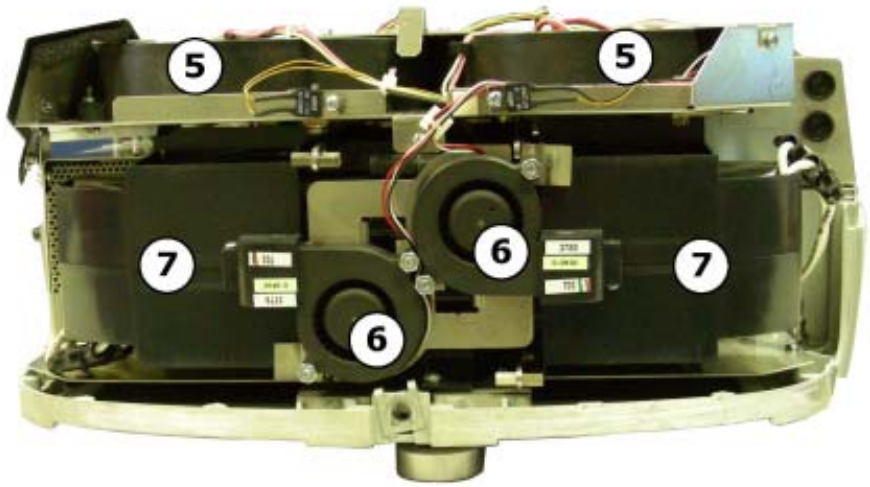


Image 4-5
Rear view of the projector

Indication	Description	Part number
5	Main lamp fans	
6	Lamp top fans	
7	UHP lamps	

View on the optical frame

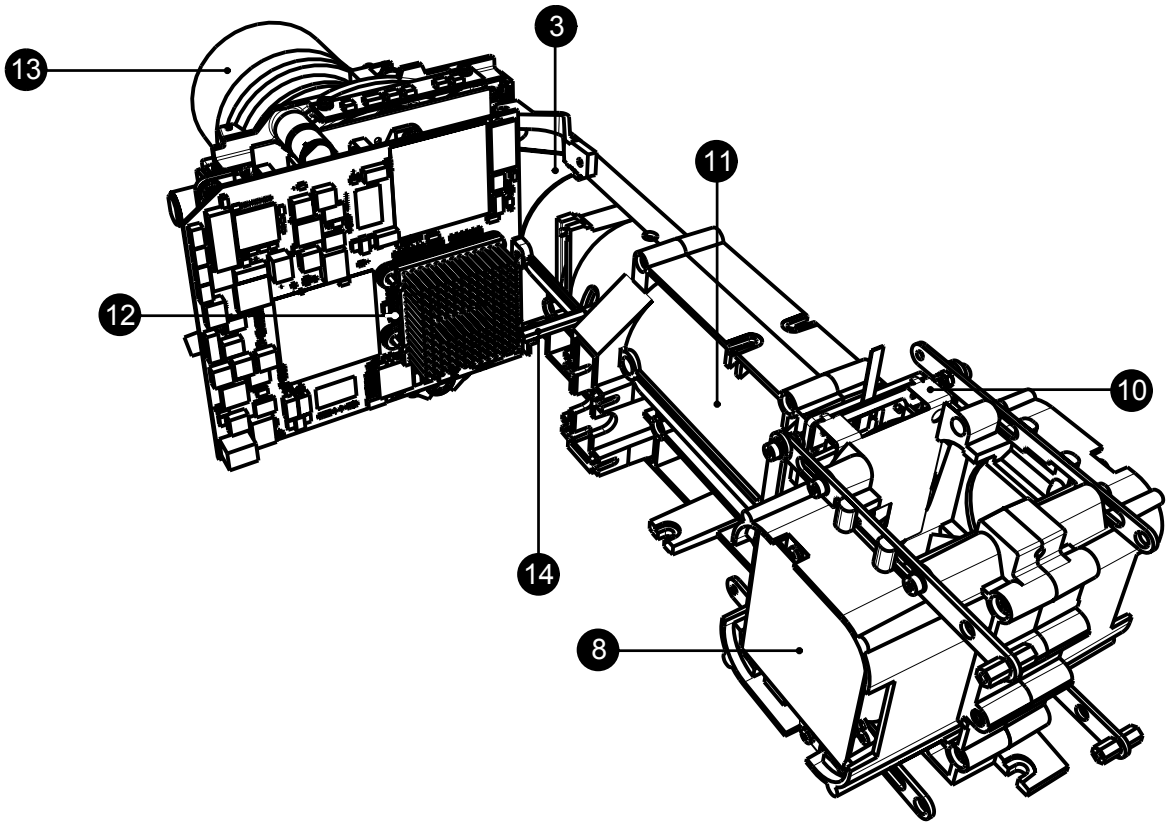


Image 4-6
Optical path (view 1)

Indication	Description	Part number
3	folding mirror	R8428901
8	UV / IR filter	R842894K
10	color wheel	-
11	light rod	-
12	DLP chip	-
13	projector lens	-
14	(adjusting handle for) a-spheric lens	

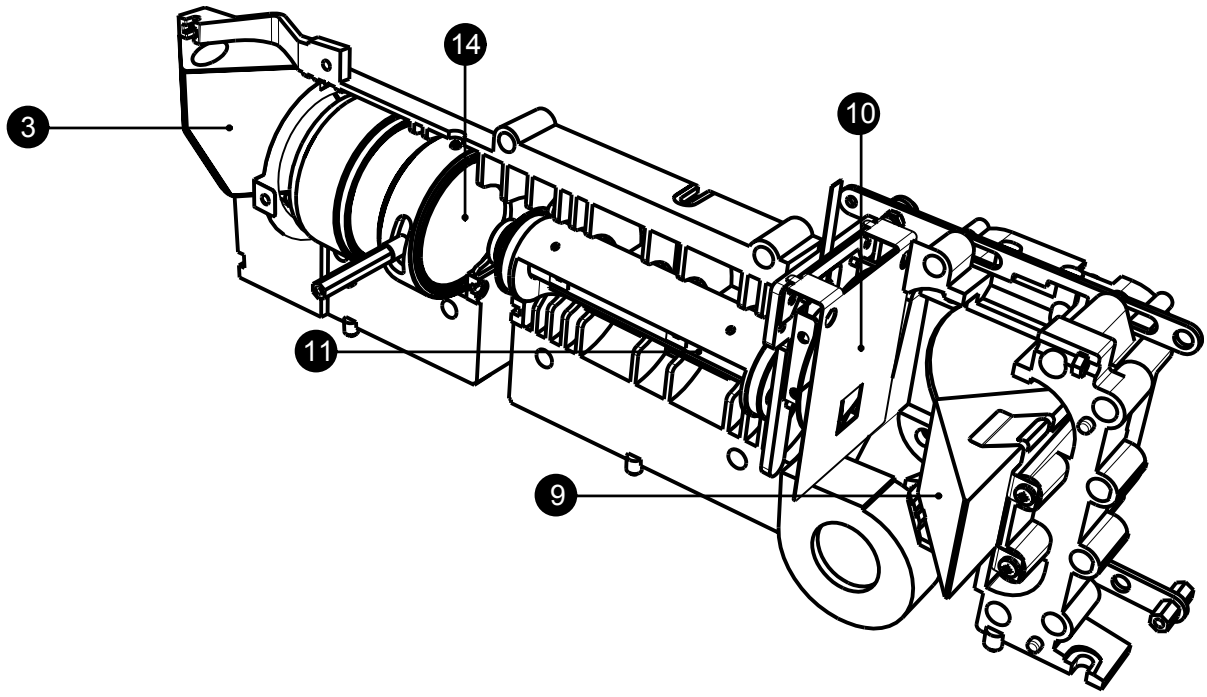


Image 4-7
Optical path (view 2)

Indication	Description	Part number
3	folding mirror	R8428901
9	prism	-
10	color wheel	-
11	light rod	-
14	a-spheric lens	

4.3 Remote control unit

RCU

Image 4-8
Remote control unit

Indication	Description	Part number
-	Remote control unit (RCU)	R763794K

5. ELECTRONIC SPARES AND SERVICING PROCEDURES

Overview

- Introduction
- Interconnection diagram
- Lamp cover removal
- The input module
- The pixel map processor (PMP)
- The formatter
- The power box
- The lamp power supply

CAUTION: Wear a wrist band which is connected to the ground while handling the electrostatic discharge sensitive parts!

To reassemble the different parts, just follow the replacement procedures in reverse order.

5.1 Introduction

Simplified signal flow

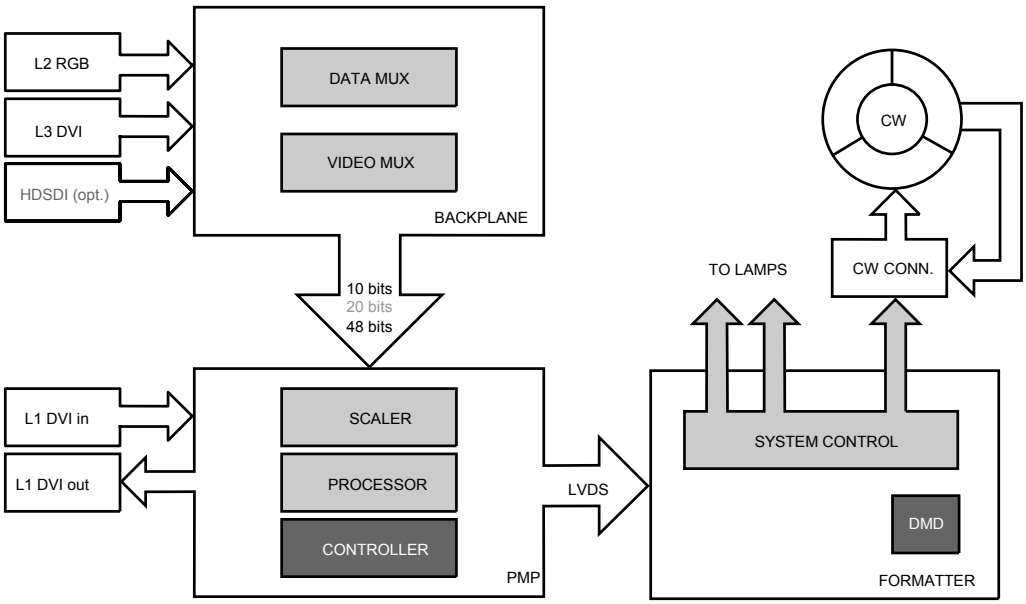


Image 5-1
Simplified signal flow

Simplified power control

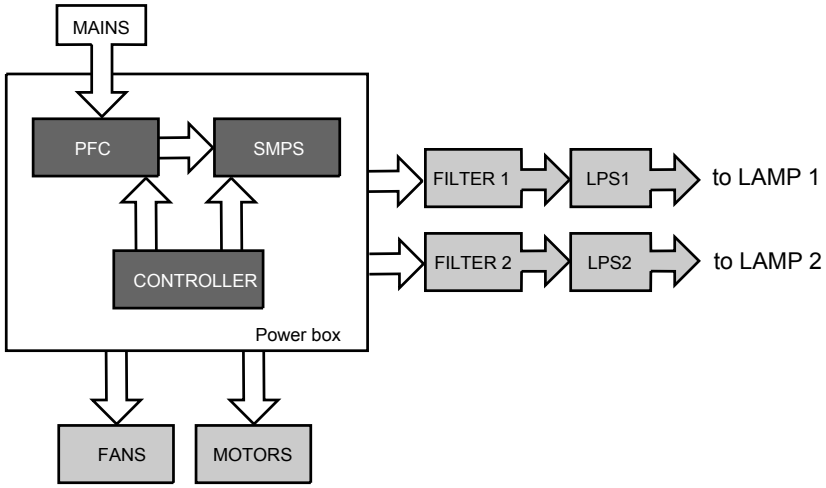


Image 5-2
Simplified power architecture

5.2 Interconnection diagram

Interconnection diagram

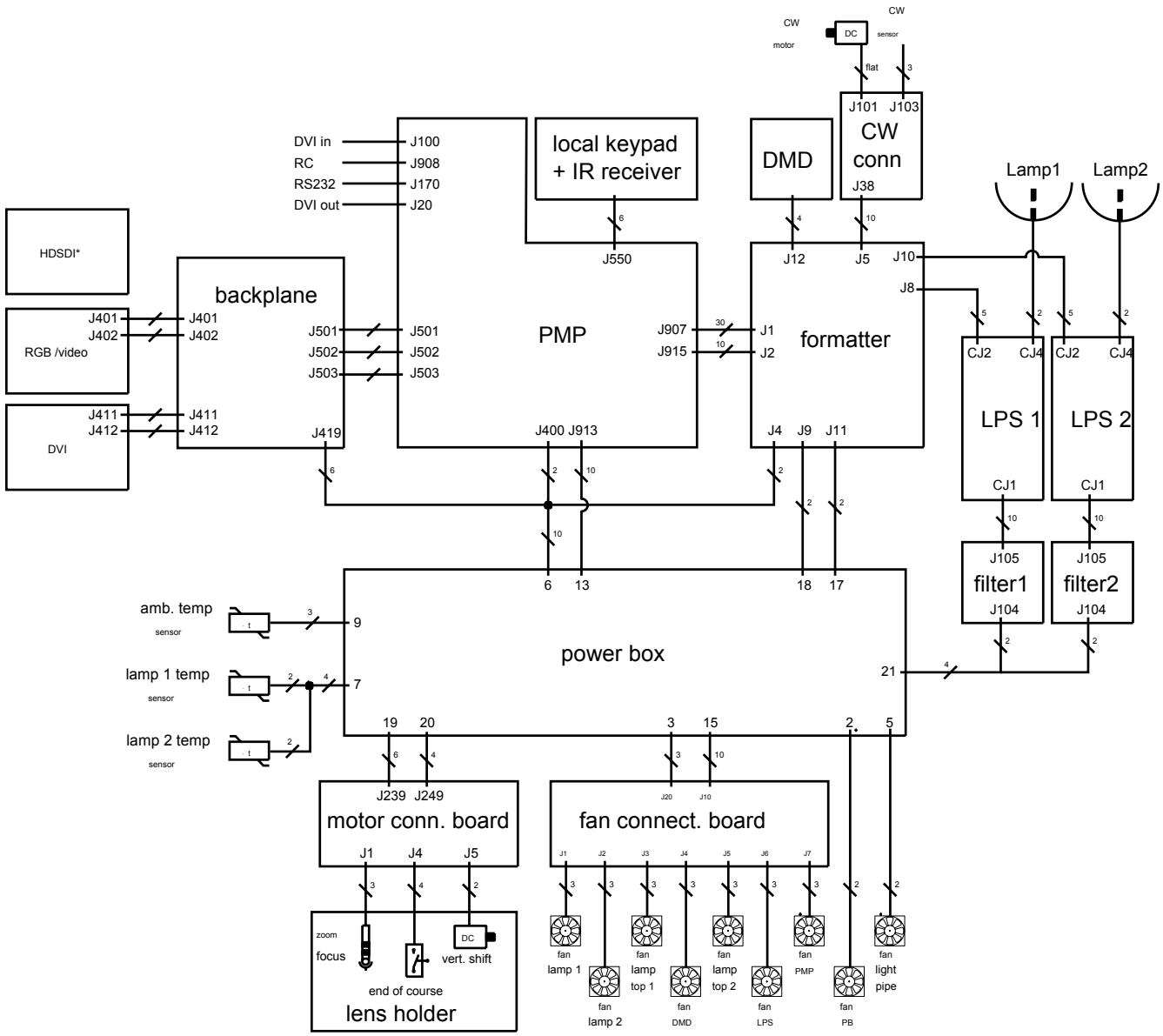


Image 5-3
Interconnection diagram

5.3 Lamp cover removal

Necessary tools

- Torx screwdriver T10
- a pair of wire cutter

The lamp cover contains the two lamp fans and guides the hot air out of the projector.

When to remove the lamp cover?

The lamp cover needs to be removed in the following cases:

- power box removal
- lamp power supply removal
- color wheel removal

How to remove the lamp cover?

1. Remove the three screws as indicated on the images below

Image 5-4
Remove the screw of the lamp cover

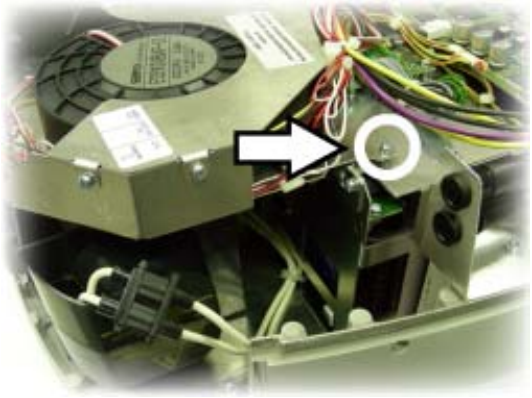


Image 5-5
Remove the screw of the lamp cover

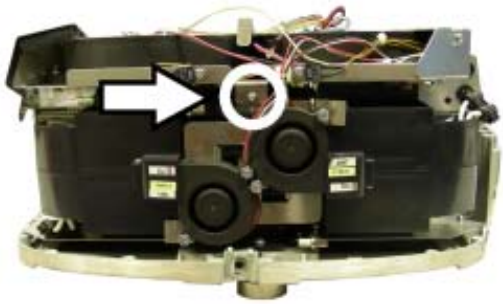


Image 5-6
Remove the screw of the lamp cover

2. Release the lamp top fan wires from the wire clamps

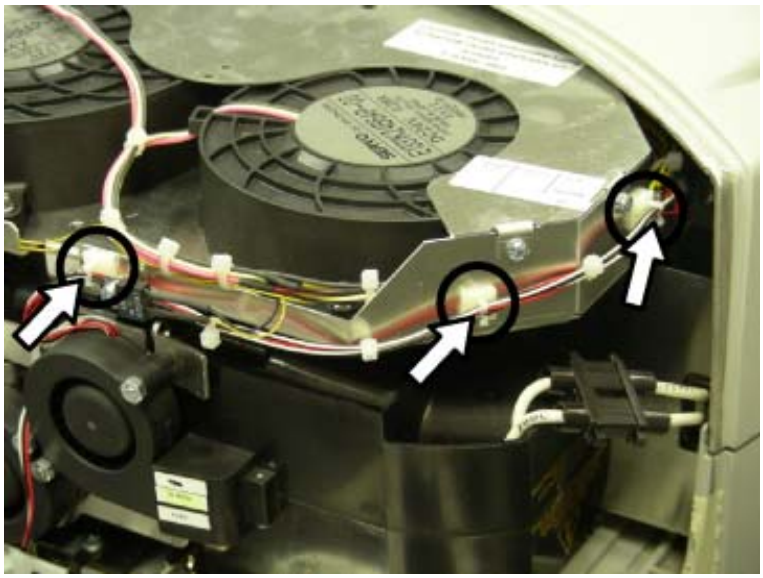


Image 5-7
Release the wires from the clamps.

3. Now you can flip over the lamp cover so as to reach the parts underneath.

5.4 The input module

Overview

- Description of the input module
- Removing the input module
- Disassembling the input module

5.4.1 Description of the input module

The input module configuration

The input module consists of several layers:

- DVI input layer: this layer is part of the PMP
- RGB / video input layer
- DVI / D15 input layer
- ethernet layer
- backplane

Image 5-8
Input module: front/left view (layer 1 removed!)

image indication	partnumber	description	optional/standard
layer 1	R765024K	DVI input layer (PMP)	standard
layer 2	R764499K	RGB / video input	standard
layer 3	R765195K	DVI / D15 input	standard
layer 2 or 3	R764442K	HDSDI input	optional
layer 4	R765226	ethernet layer	standard
backplane	R765023	backplane	standard

5.4.2 Removing the input module

Necessary tools

- long screwdriver Ph1
- Torx screwdriver T10

How to remove the input module?

1. Remove the PMP — See "Removing the PMP", page 47
2. Loosen the two screws fixing the input module (use a long screwdriver)

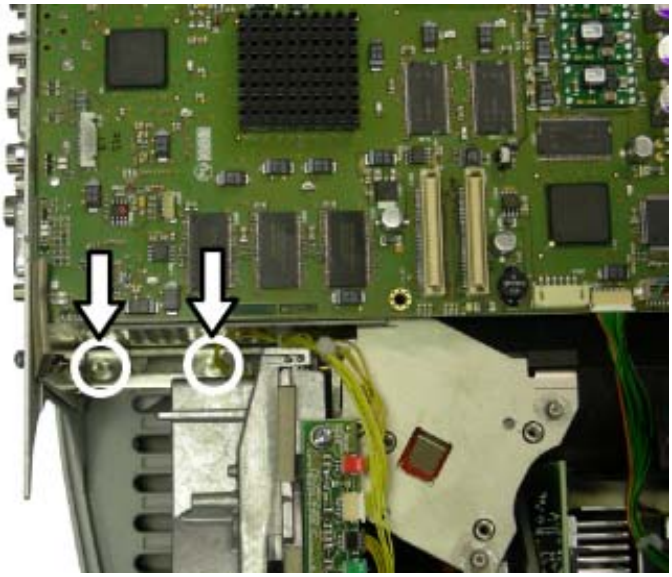


Image 5-9
Input module: fixing screws

3. Slightly lift the input module and disconnect the power connector

- J419 (6 wires): power from the power box (connector 6)

Image 5-10
Input module: connector

4. Lift the input module to remove it

5.4.3 Disassembling the input module

Overview

- The backplane
- The DVI input
- The RGB and Video input
- The DVI and D15 input
- The SDI / HDSDI input (optional)
- The ethernet board

5.4.3.1 The backplane

5.4.3.1.1 Description of the backplane

What does the backplane do?

Image 5-11

- preprocessor (can handle two input channels)
  - AMDS: automatic mode detection system
  - APA: automatic pixel alignment
  - prescaling
- deinterlacer
- ethernet switch

5.4.3.1.2 Replacing the backplane

Necessary tools

No tools.

How to replace the backplane?

1. Remove the input module from the projector — See "Removing the input module", page 32
2. Remove the backplane by gently disconnecting it from the assembly

Image 5-12
Input module: removing the backplane

Image 5-13
Input module: backplane released

5.4.3.2 The DVI input

Description of the DVI input (layer 1)

This layer contains a DVI input connector, a wired RC connector, a RS232 input connector and a DVI output connector.

See "Removing the PMP", page 47 to remove the DVI input layer.

5.4.3.3 The RGB and Video input

5.4.3.3.1 Description of the RGB / Video input

What does the RGB / Video input do?

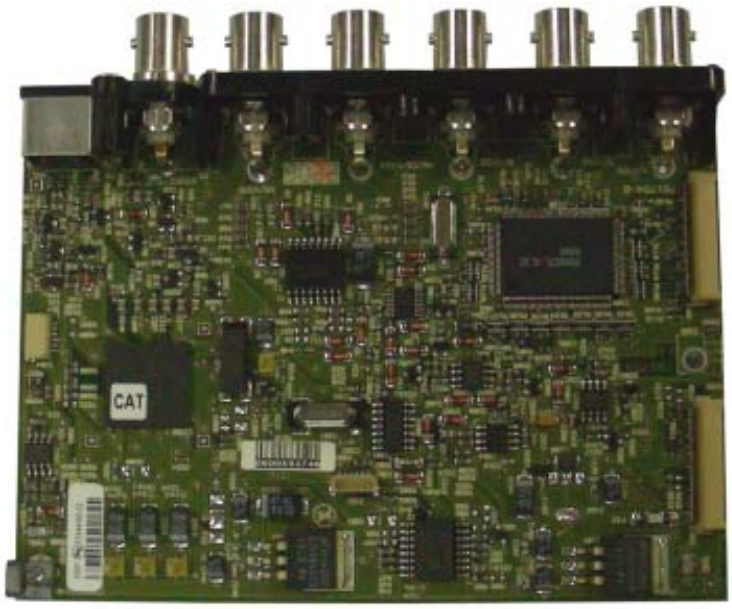


Image 5-14
RGB / Video input board

- a data signal goes to an ADC and is converted into 48 bits
- a video signal goes to a decoder + ADC and is converted into 10 bits

The RGB/video input board can process one data source and one video source at the same time.

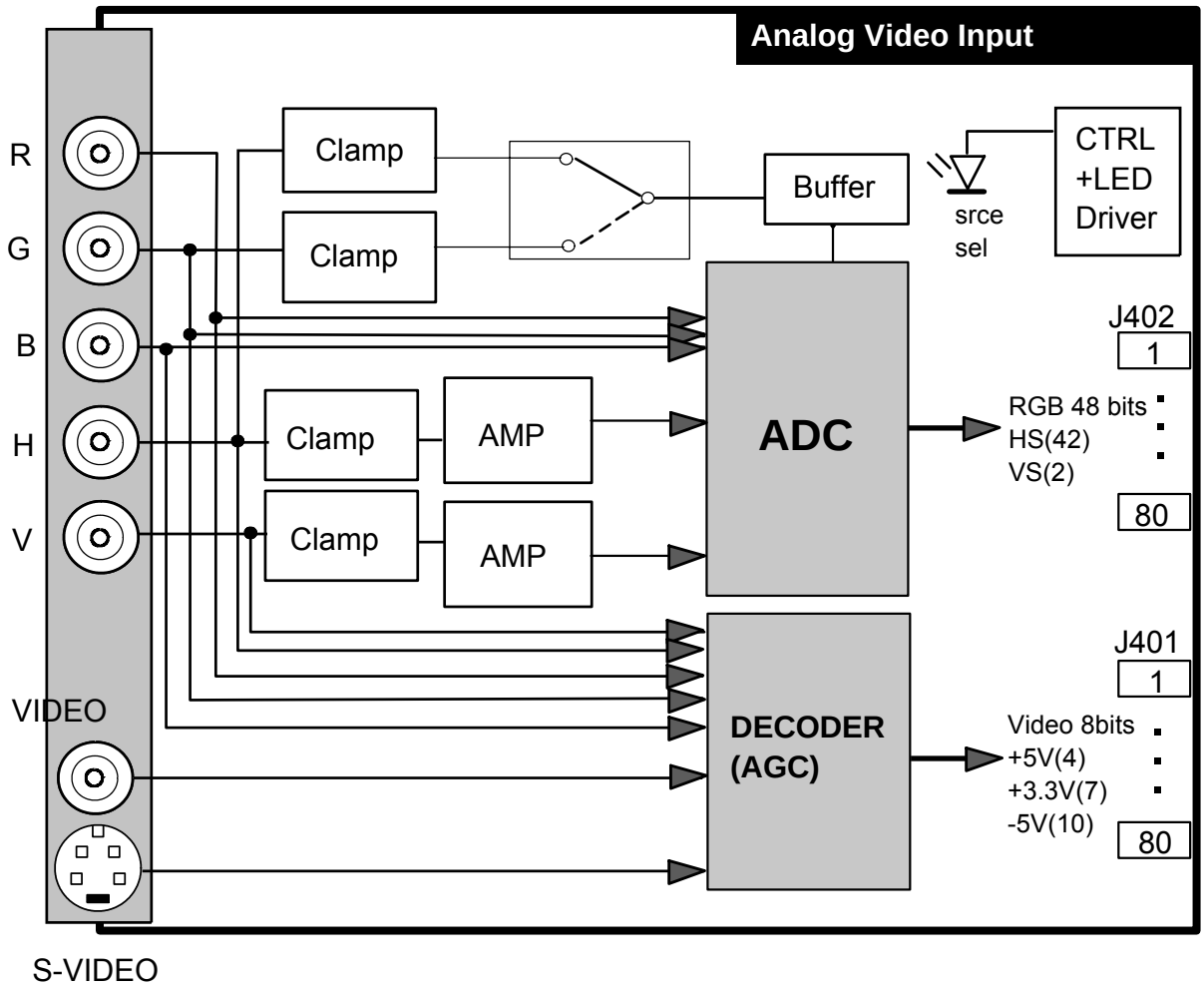


Image 5-15

5.4.3.3.2 Replacing the RGB / Video input

Necessary tools

Torx screwdriver T10

How to replace the RGB / Video input?

1. Remove the input module form the projector — See "Removing the input module", page 32
2. Remove the backplane — See "Replacing the backplane", page 34
3. Remove the side screw

Image 5-16
Input module: side screw fixing the RGB / video input layer

4. Remove the three front screws

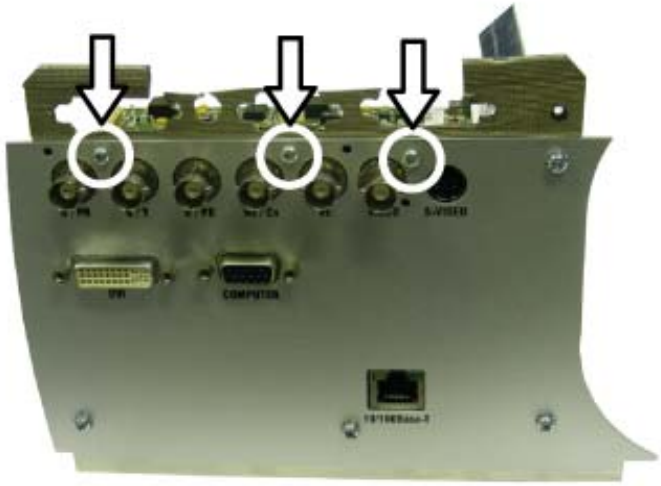


Image 5-17
Input module: front screws fixing the RGB / video input layer

5. Take out the RGB / Video input

5.4.3.4 The DVI and D15 input

5.4.3.4.1 Description of the DVI / D15 input

What does the DVI / D15 input do?

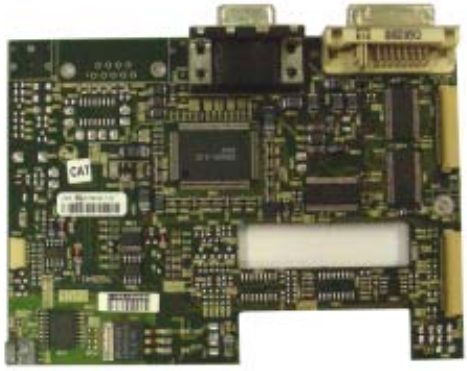


Image 5-18
The DVI / D15 input

- the signal from the D15 connector goes to an ADC and is converted into 48 bits
- the signal from the DVI connector goes to a DVI receiver. The output is 48 bits

Both signals can not be processed at the same time because there is a switcher which routes one signal or the other.

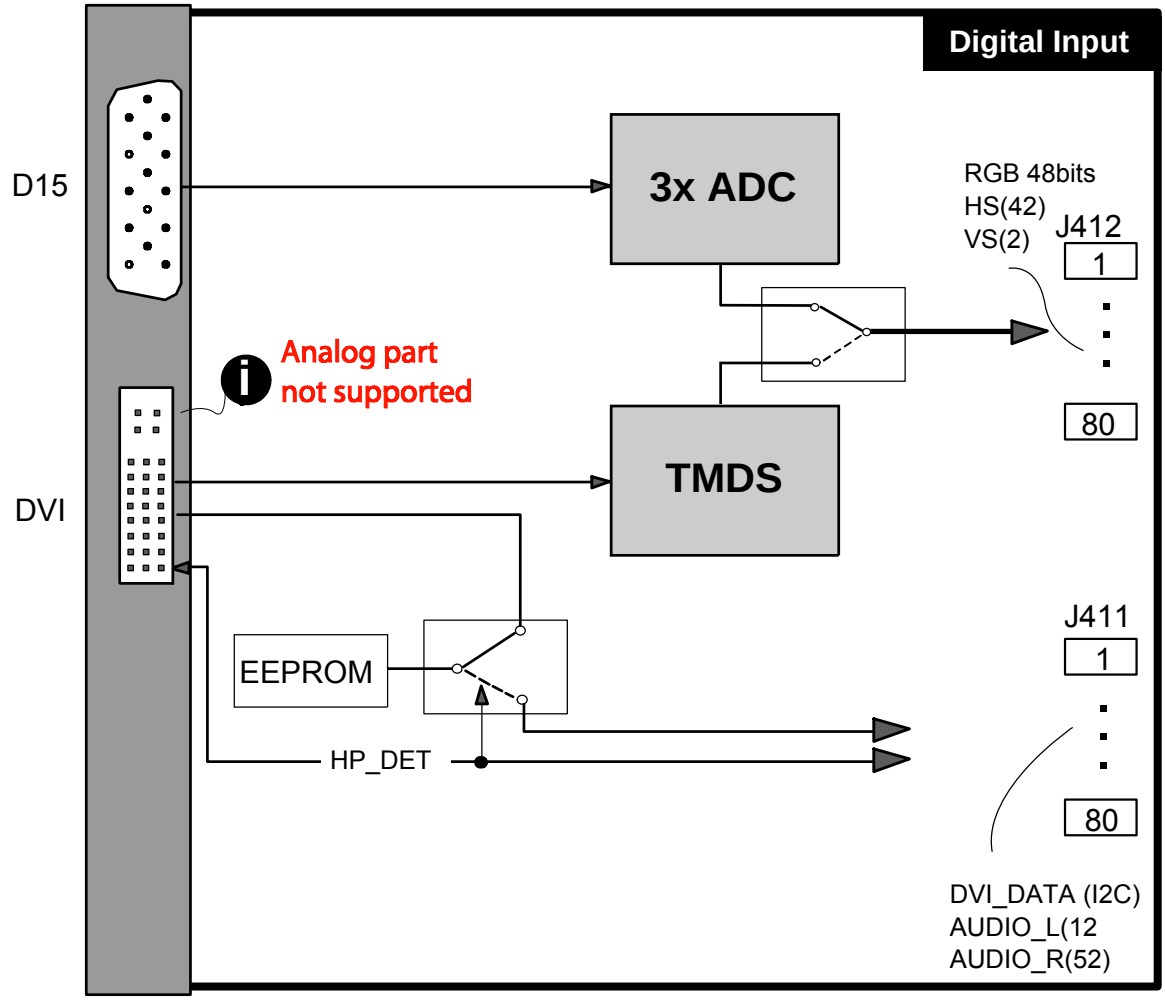


Image 5-19
DVI / D15 input layer

5.4.3.4.2 Replacing the DVI / D15 input

Necessary tools

- Torx screwdriver T10
- nut spanner 4mm

How to replace the DVI / D15 input?

1. Remove the input module — See "Removing the input module", page 32
2. Remove the backplane — See "Replacing the backplane", page 34
3. Remove the side screw

Image 5-20
Input module: side screw fixing the DVI / D15 input layer

4. Remove the front nuts

Image 5-21
Input module: front nuts fixing the DVI / D15 input board

5. Take out the DVI / D15 input board

5.4.3.5 The SDI / HDSDI input (optional)

5.4.3.5.1 Description of the SDI / HDSDI input

What does the SDI / HDSDI input do?

Image 5-22
SDI/HDSDI input layer

A serial digital video signal is detected (SDI or HDSDI) and converted to a 10 bits or 20 bits parallel signal.

Both signals can not be processed at the same time because there is a switcher which routes one signal or the other.

Both output connectors provide the serial digital information form the source.

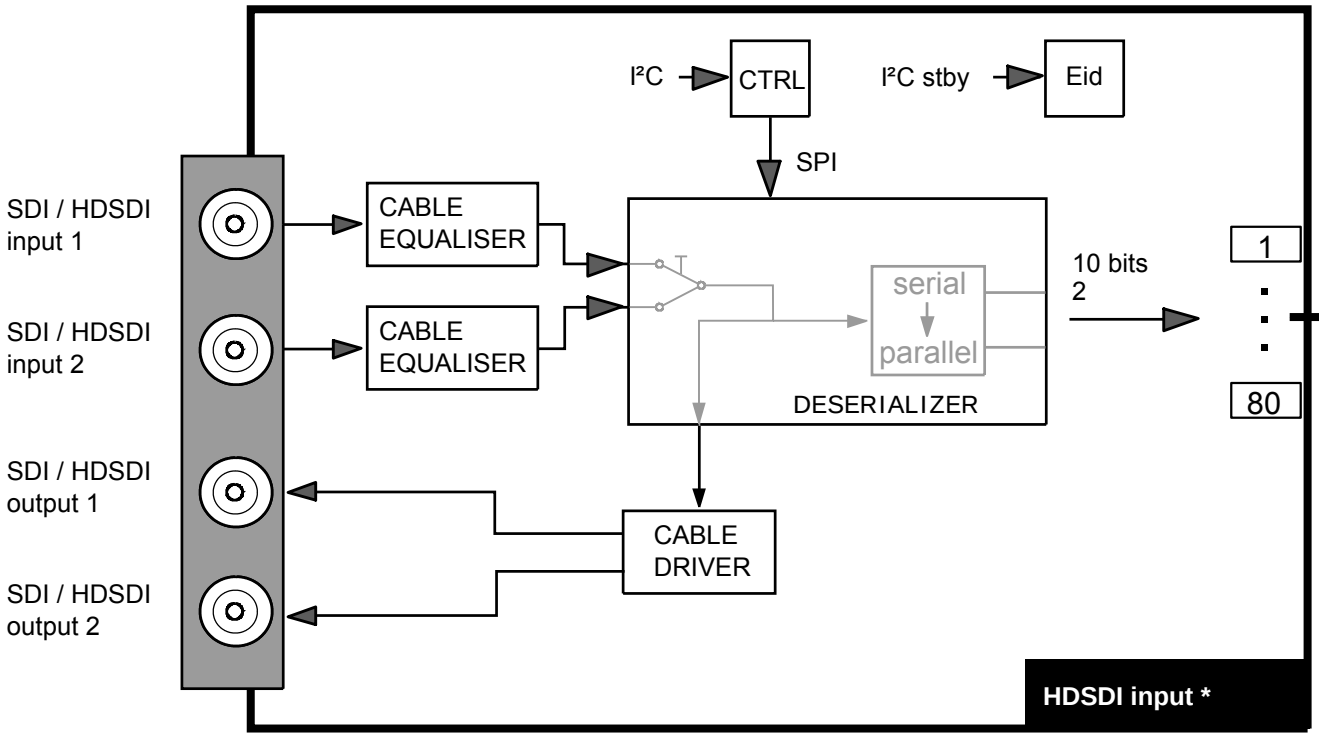


Image 5-23

5.4.3.5.2 Installing the SDI / HDSDI input

Necessary tools

screwdriver Torx T10

How to install the SDI / HDSDI input?

1. See the installation manual which is delivered with the SDI / HDSDI input kit.

5.4.3.6 The ethernet board

5.4.3.6.1 Description of the ethernet board

What does the ethernet board do?

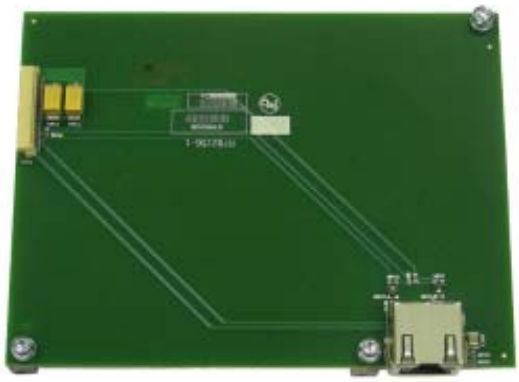


Image 5-24
Input module: ethernet board

The ethernet communication can be used to:

- download new software on the projector (upgrading)
- set up serial communication with the projector (TCP packets)

This RJ45 connector is connected to the ethernet switch on the PMP.

5.4.3.6.2 Network settings

What can be done?

These settings are used to set the Ethernet Communication parameters.

The Ethernet connection can be used to upload/download projector software and/or to set up RS232 communication (TCP-packets) with the projector.

Following parameters are available :

MAC Address	MAC Address of the projector (This is a non-adjustable value programmed into the Ethernet board).
IP Address (Current)	IP Address of the projector (This is a non-adjustable value).
Subnet Mask	Subnet Mask (This is a non-adjustable value)
Gateway	Gateway (This is a non-adjustable value)
DHCP	DHCP setting: • *Yes*: The projector will dynamically obtain its IP address from the DHCP server. • *No*: The IP address needs to be entered manually. Note that when selecting **Fxed IP** the IP settings fields are enabled
IP Address	Fixed IP Address of the projector : this field can be edited when Fixed IP is selected
Subnet Mask	Subnet Mask : this field can be edited when Fixed IP is selected
Gateway	Gateway : this field can be edited when Fixed IP is selected
Hostname	Hostname : this field can be edited when DHCP is selected

How to set up the network settings ?

1. Press the **MENU** key to activate the Menu bar.

2. Push the cursor key ← or → to highlight *Installation* in the menu bar.
3. Push the ↓ key to pull down the *Installation* menu.
4. Push the cursor key ↑ or ↓ to highlight *Network settings* and press **ENTER** to select.

Image 5-25

A dialog box will be displayed.

Image 5-26

5. Push the cursor key ↑ or ↓ to highlight the desired parameter.
6. Use the cursor key ← or → , the numeric keys on the RCU, or the local keypad, to edit and change the values.
7. Press **Apply settings** to apply the changes

   A dialog box is shown. The different executed operations are shown with a checkbox. The last operation *Restarting network* takes a few seconds more.

Image 5-27

5.4.3.6.3 Diagnostics of the ethernet board

Diagnostic LEDs

There are two indication LEDs:

- left LED (orange): ON during TX activity (transmission only)
- right LED (green): ON when a link is established

Image 5-28
ethernet connector: indication LEDs

5.4.3.6.4 Replacing the ethernet board

Necessary tools

Torx screwdriver T10

How to replace the ethernet board?

1. Remove the input module form the projector
2. Remove the backplane
3. Remove the side screw

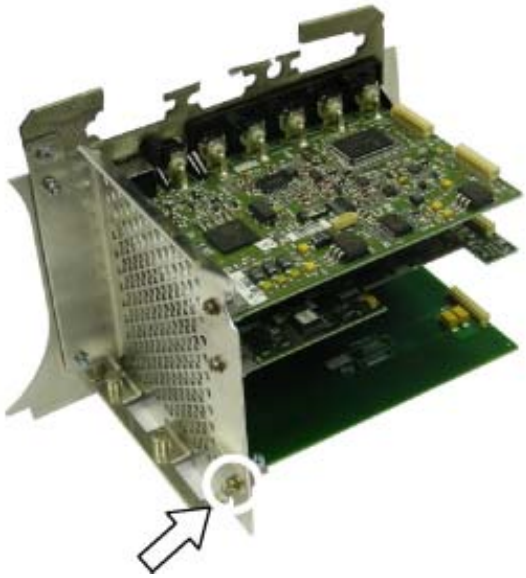


Image 5-29
Input module: side screw fixing the ethernet board

4. Remove the two front screws

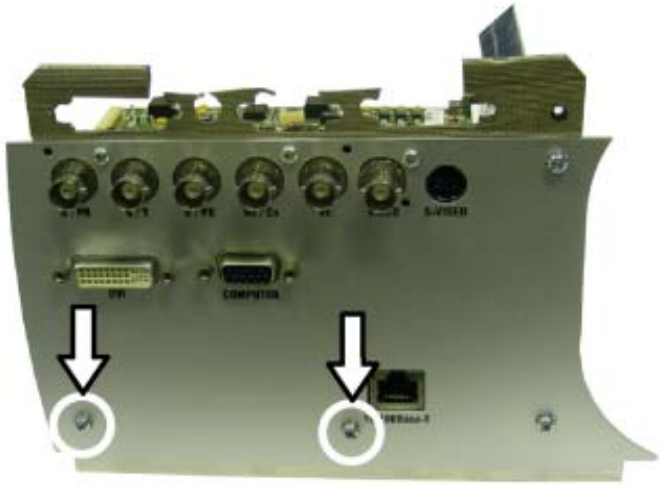


Image 5-30
Input module: front screws fixing the ethernet board

5. Take out the ethernet board

5.5 The pixel map processor (PMP)

Overview

- Description of the PMP
- Diagnostics of the PMP
- Removing the PMP

5.5.1 Description of the PMP

Description

- The PMP receives the input signals in two ways:
  - the input connectors on the PMP board: DVI connector
  - the separate input layers via the backplane: 10 bits for video image, 48 bits for data image
- In the scaler, several signals can be mixed with the server signal before being sent to both the formatter and the DVI output.
- The preprocessor handles the incoming and outgoing DVI signals.
- The PMP also contains a processor and a HDTV deinterlacer.
- The RS232 serial port is connected to the processor.
- The OSD FPGA is situated behind the scaler.
- Digital data is converted to LVDS before it is sent to the formatter.

Schematic overview

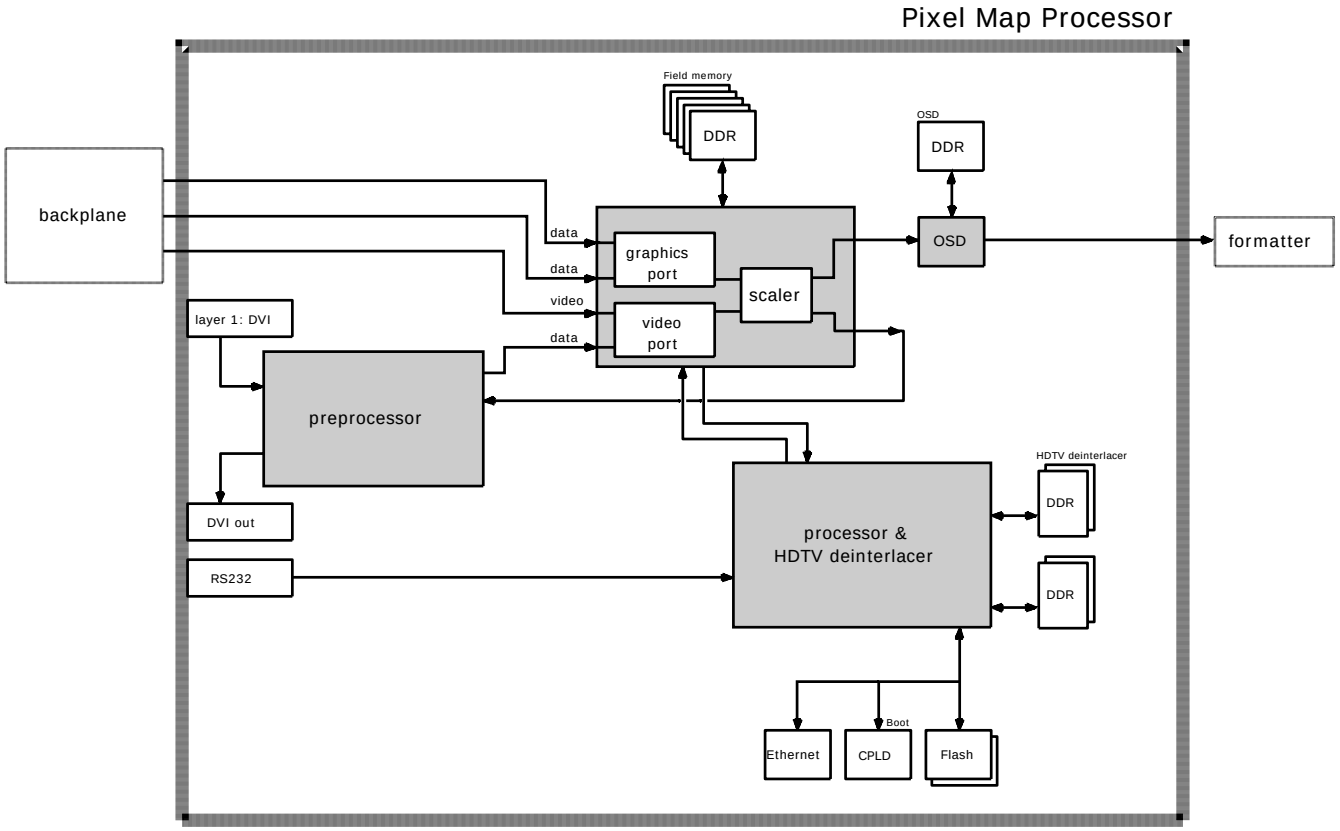


Image 5-31
PMP: schematic overview

PMP: board layout

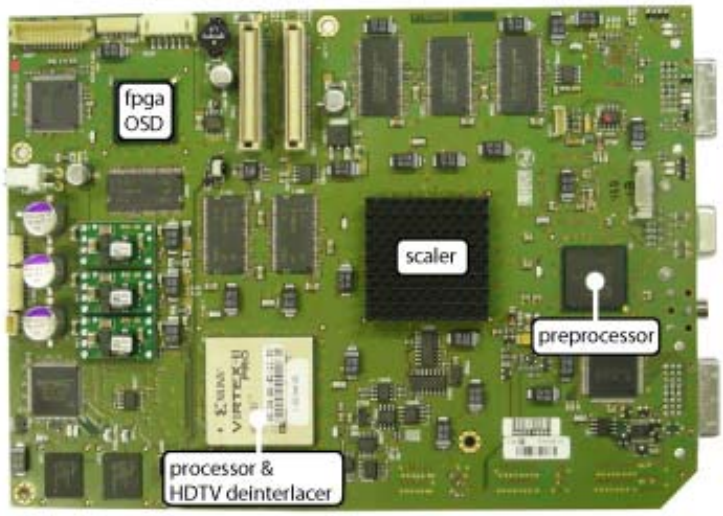


Image 5-32
PMP: board layout

5.5.2 Diagnostics of the PMP

Field Programmable Gate Array

Network of logical gates which can be customized (programmed for a particular use)

LED diagnostics during the startup of the projector

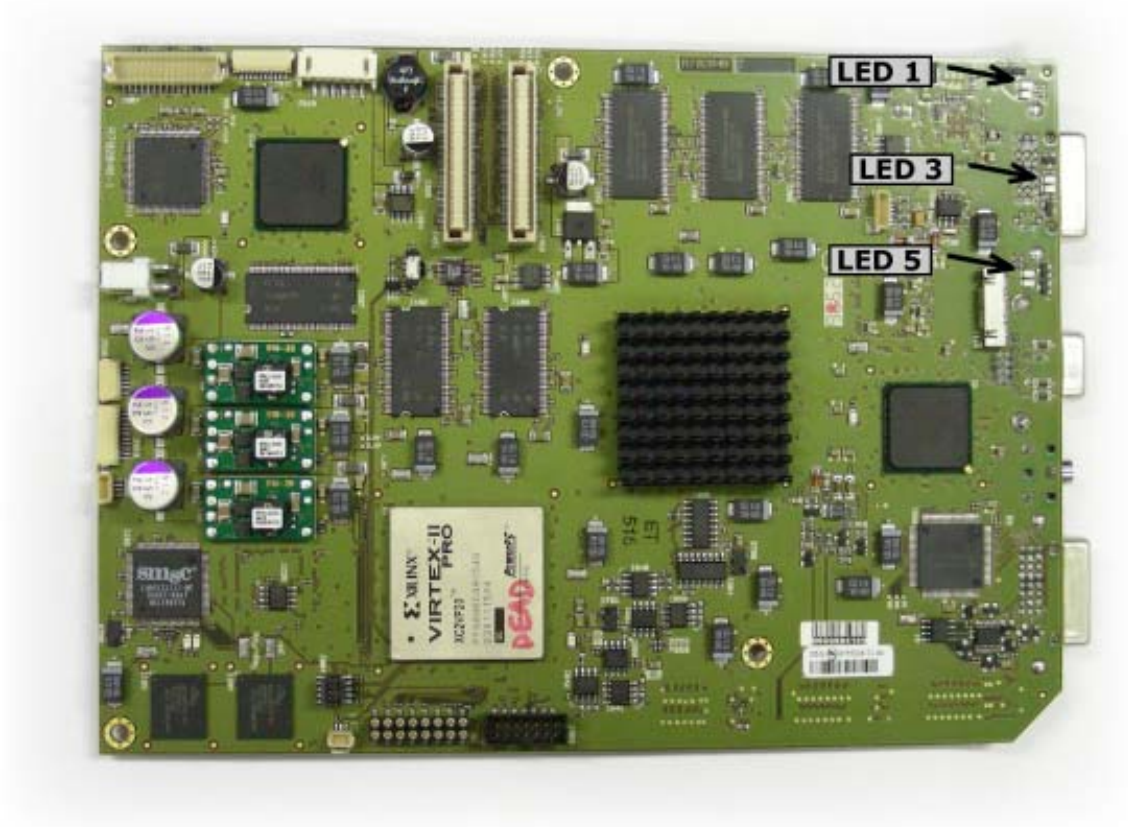


Image 5-33
PMP: indication LED's during startup

- First stage of startup: **LED 1** (red) and **LED 5** (red) are **ON**
  In case of system failure during this stage, LED 1 stays ON and LED 5 starts blinking.
- Second stage of startup: **LED 1** (red), **LED 3** (red) and **LED 5** (red) lare **ON**
- Third stage of startup (user program startup): **LED 1** (red) and **LED 5** (red) are **ON**
- End of startup cycle (projector is ready to receive commands): **LED 1** (red) is **ON**

LED diagnostics

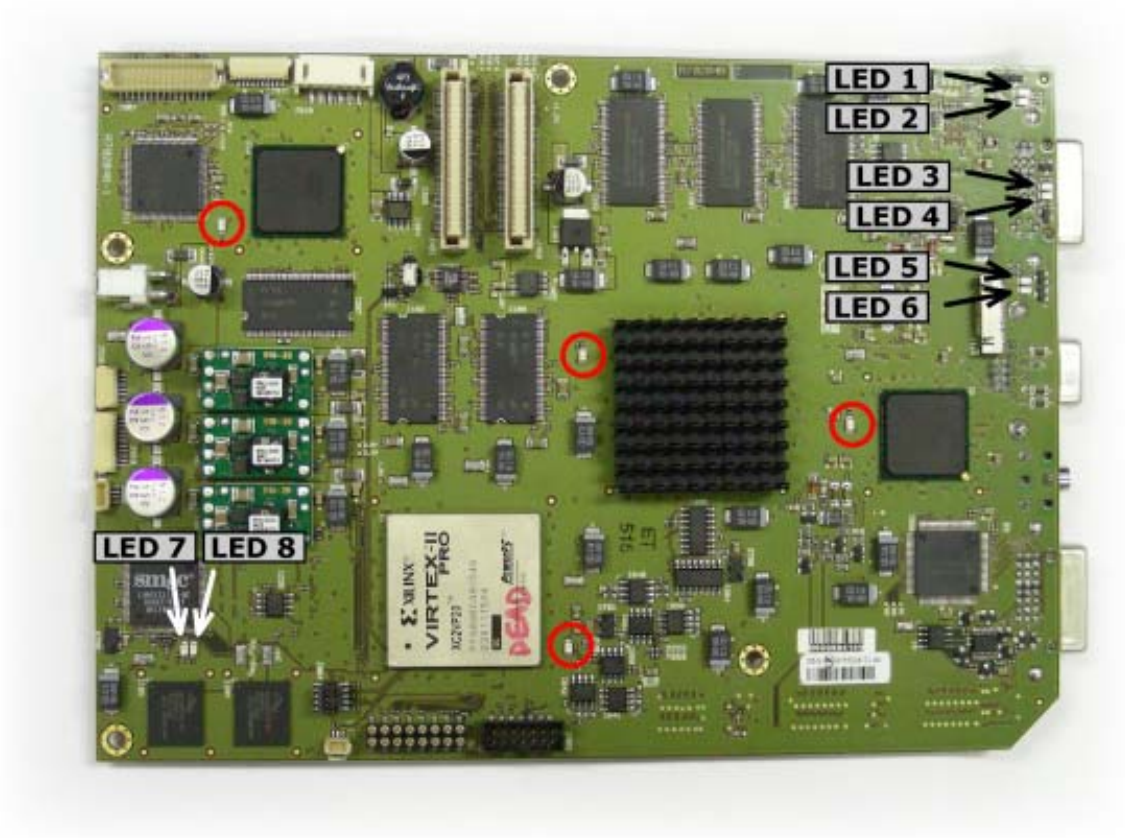


Image 5-34
PMP: diagnostic LED's

LED	color	description
1	red	ON during standby of the projector
2	green	ON during IR acknowledgement
3	red	ON in case of power box failure or lamp error
5	red	ON during boot sequence
6	green	BLINKING during the cooling down time of the lamps
5+6	orange	ON during update
2+4+6	green	BLINKING while powering on the projector
2+4+6	green	BLINKING x times in turn to indicate projector address while in standby (see owner's manual)
1+5	red	ON during the 1st and 3rd stage of the startup cycle
1+5	red	LED 1 is ON, LED 5 is BLINKING when a system failure occurred during the 1st stage of the startup
1+3+5	red	ON during the 2nd stage of the startup cycle
7	green	Ethernet link between PMP and ethernet switch on PMP established
8	red	sending or receiving a package of information via Ethernet
others	red	ON if the according FPGA is not configured well

5.5.3 Removing the PMP

Necessary tools

- Torx screwdriver T10
- nut spanner 4mm

How to remove the PMP?

1. Remove the connectors:
   - J400 (2 wires): power from the power box (connector 6)
   - J550 (6 wires): control signals from the local key pad / IR receiver
   - J907 (30 wires): video / data signal to the formatter (connector J1)
   - J913 (10 wires): control signals to the power box (connector 13)
   - J915 (10 wires): I²C to the formatter (connector J2)
   - GND (ground): remove the screw

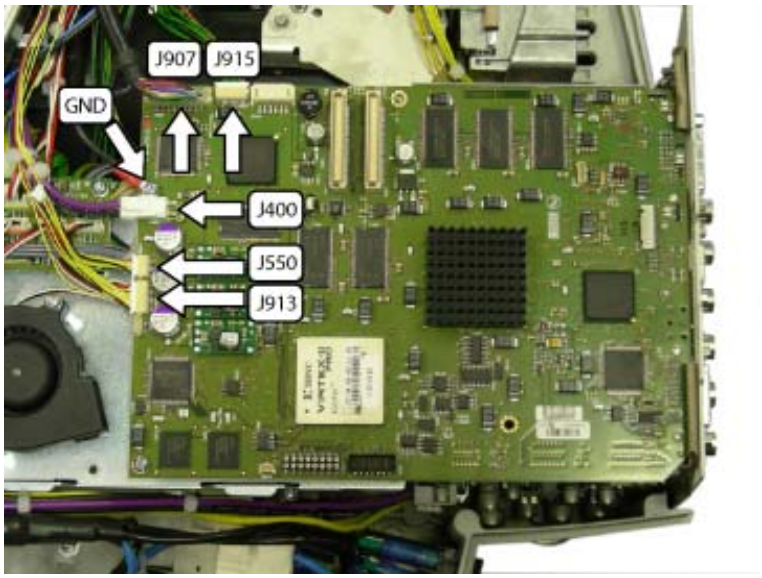


Image 5-35
PMP: connectors

2. Remove the top screw

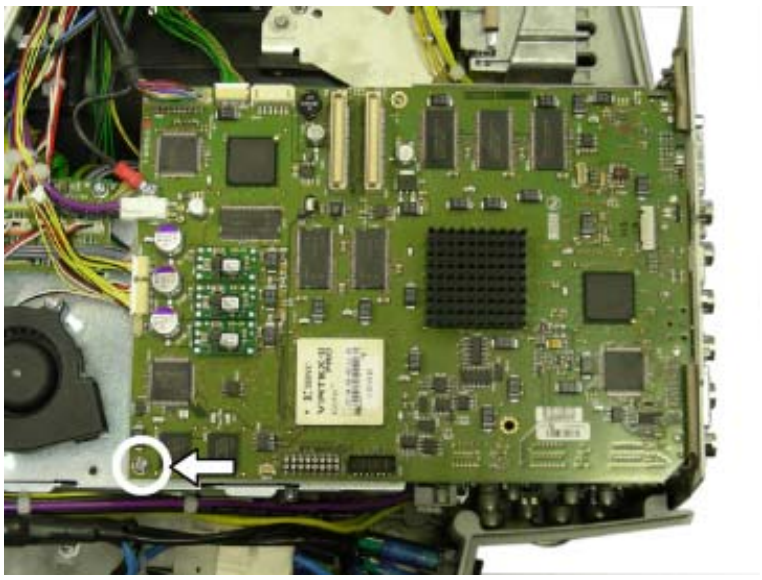


Image 5-36
PMP: fixing screw

3. Remove the screw and the six nuts on the front plate of layer one of the input box

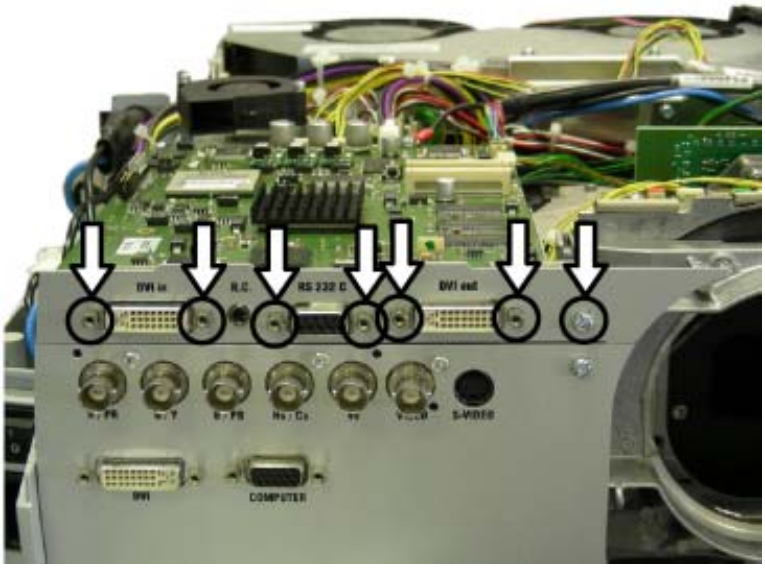


Image 5-37
PMP: screw and nuts fixing the PMP / input layer 1

4. Gently lift the PMP, while disconnecting the board-to-board connectors to remove it

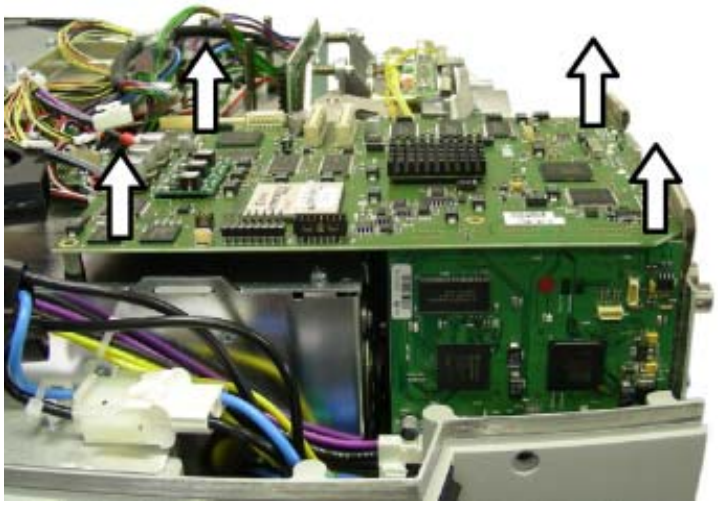


Image 5-38
PMP: lift to remove it

5.6 The formatter

Overview

- Description of the formatter
- Replacing the formatter

5.6.1 Description of the formatter

Description

The formatter board is a digital image processing unit where the data is converted from 9 pairs of LVDS to 2x30 bits of digital information to be sent to the DMD.

The formatter has two channels of 30 bits because of the high resolution of the DMD.

The main tasks of this formatter board are:

- image processing: the input data is converted into a bit plane output format to drive the DMD image bus
- control to and feedback from the color wheel
- control of the lamp power supply
- brilliant color mode: increase brightness through the use of the white segment and spokes of the color wheel
- color coordinate adjustment (dynacolor)
- DC-DC convertors to provide the various voltages

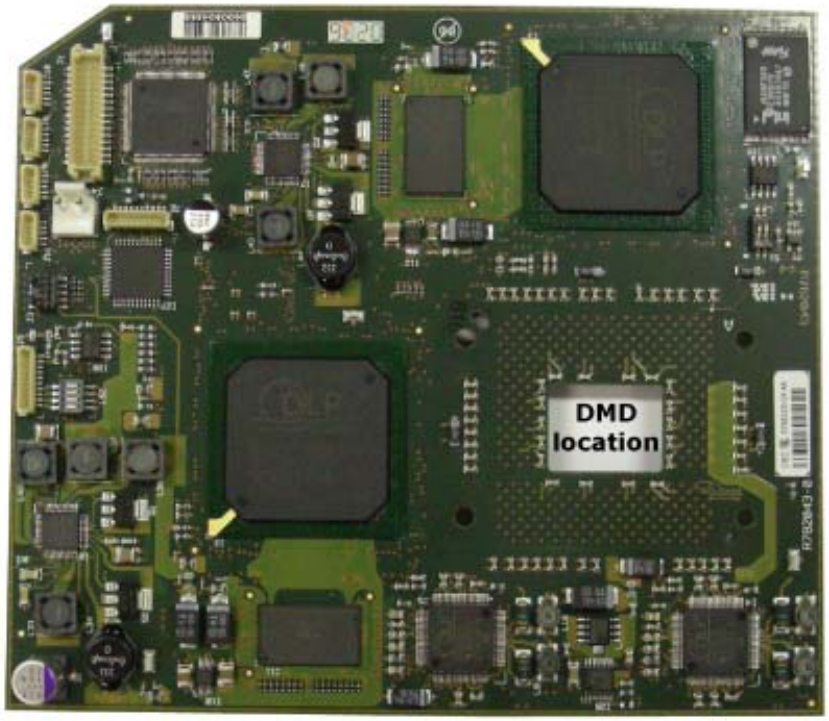


Image 5-39
Formatter board (without DMD!)

5.6.2 Replacing the formatter

Necessary tools

nut spanner 5.5mm

How to replace the formatter?

Do not proceed when you are in a dusty environment! Dust will fall onto the DMD.

1. Remove the lens holder — "Removing the lens holder", page 99
2. Remove the two top nuts. Be careful not to drop the springs!
   Tip: *Look at the position of the nuts: they must be in the same position when remounting a new formatter (focus !).*

Image 5-40
Lens holder and formatter: top view

3. Remove the bottom nut. Be careful not to drop the spring!
   Tip: *Look at the position of the nut: it must be in the same position when remounting a new formatter (focus !).*

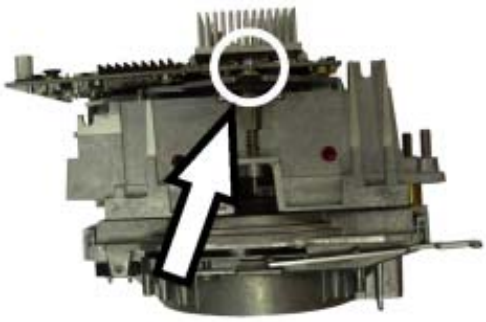


Image 5-41
Lens holder and formatter: bottom view

4. Gently remove the formatter board. Do not remove the DMD from the formatter board.
   Caution: *Do not touch the DMD and make sure to keep the DMD clean!*

   Caution: *Do not bend the formatter board, since this will cause damage to it!*

5.7 The power box

Overview

- Description
- Diagnostic LED's
- Replacing the power box

5.7.1 Description

Description

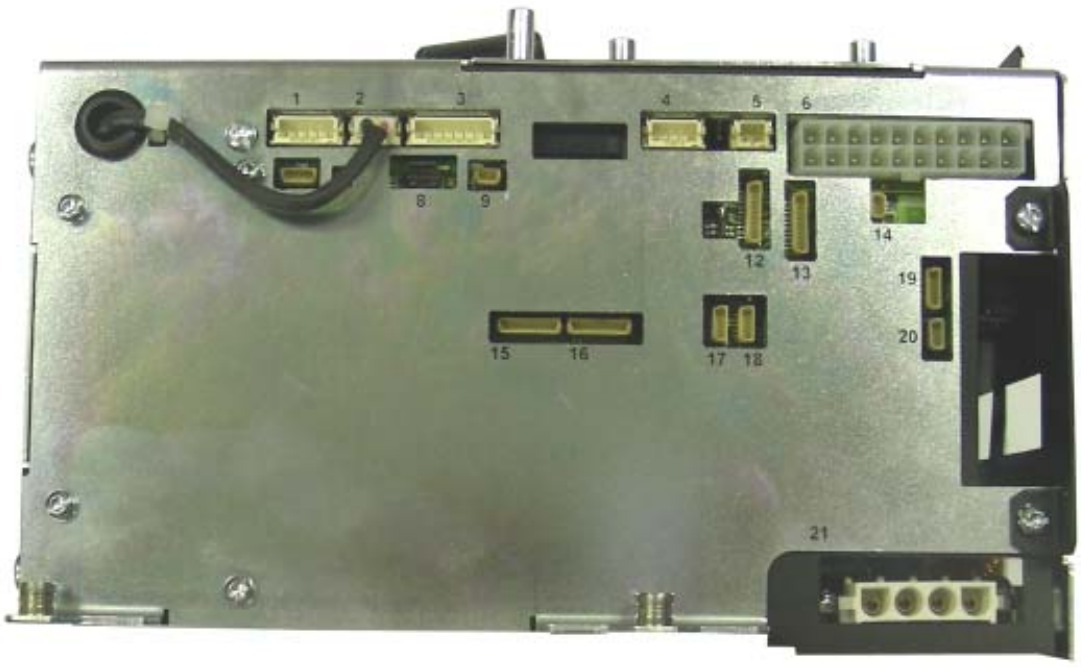


Image 5-42
Power box: right side with connectors

Image 5-43
Power box: left-rear view with mains connector

This universal 12V power box is delivered as a complete unit in a metal shielded box. All the power supply electronics for the boards are mounted inside this box. There is a CPLD containing the software for the power box. There is also a connector to provide the power for the lamp power supplies (through the lamp filters).

The following voltages are generated:

- power supply for both LPS (lamp power supply)
- ++12V standby voltage
- +12V for active projector state without image projection
- +12VA for active projector state and image projection (to formatter)

Configuration

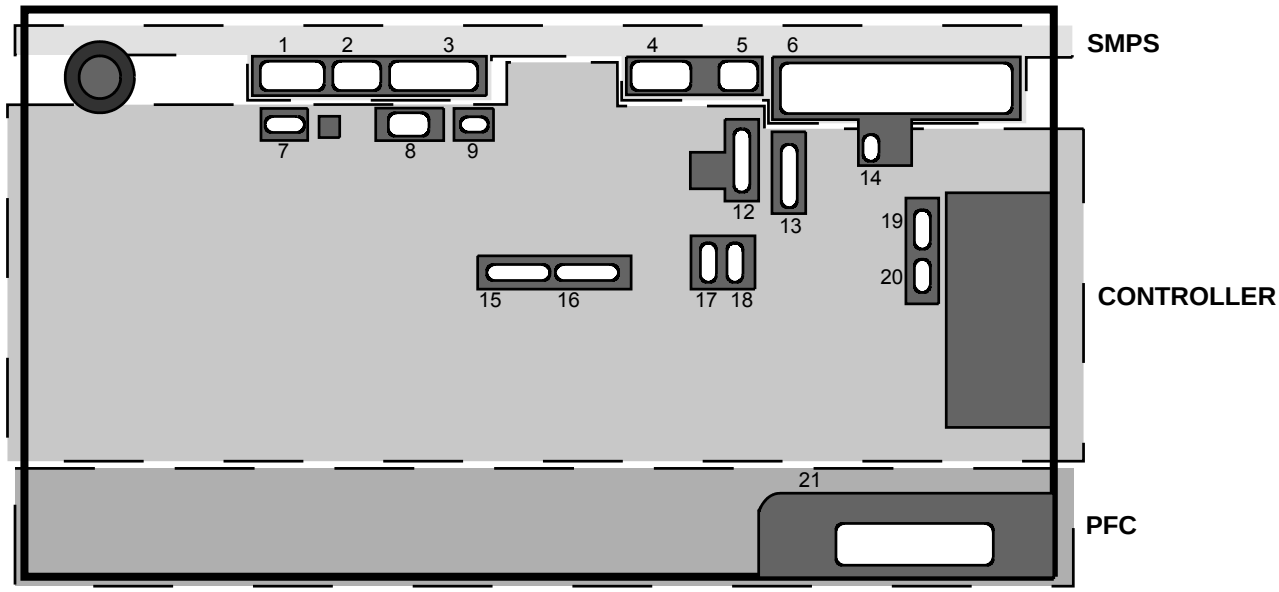


Image 5-44
Power box layout

The power box consists of three boards that are communicating through board to board connectors. For safety reasons, there are insulating plates located between the boards and on top of the SMPS: these plates must always be present!

The three boards are:

- PFC (power factor connector)
- SMPS (switched mode power supply)
- controller board

board	description
PFC	Generates a stable DC voltage for the SMPS Generates the power for both LPS. Each LPS is protected by a fuse.

board	description
SMPS	Supplies the various voltages: ++12V, +12V, +12VA Generates the control voltages for (in defined groups): • lamp fans • DMD fan • LPS fan • lamp top fans • light pipe fan • PB (power box) fan • PMP (pixel map processor) fan
controller	Receives and generates various control signals: • motor power control • lamp control signals • lens motor control signals • temperature sensing feedback signal • DMD temperature sensing feedback signals • ambient temperature feedback signal

Connectors

Overview of the connectors on the powerbox.

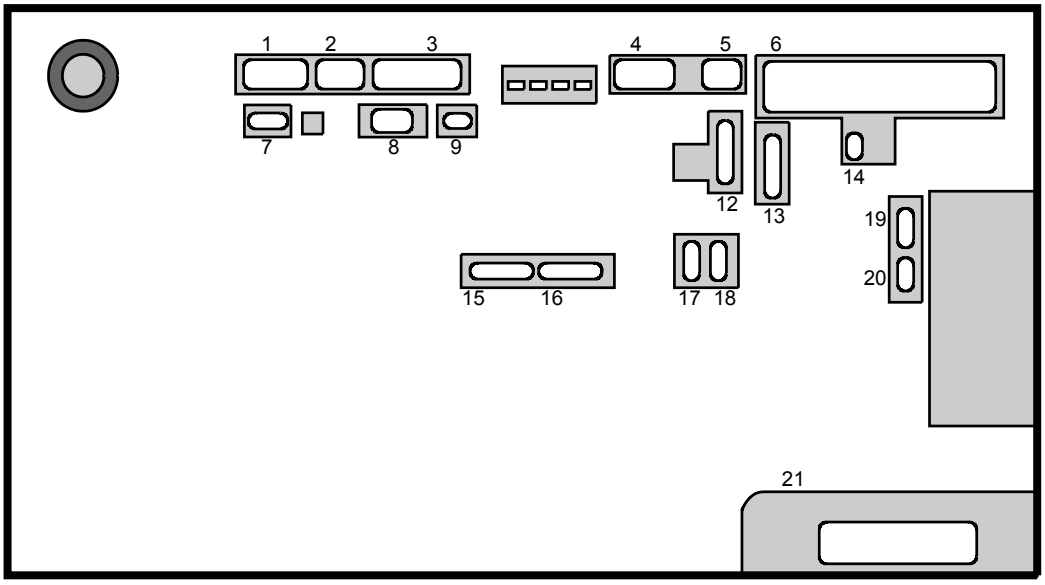


Image 5-45
Connectors on the right side of the power box

Connector	Description
2	fan of the powerbox
3	power supply for the fan connector board (5 groups of voltages for 7 fans)
5	lightpipe fan
6	++12V standby , +12V operational , +12VA operational and image
7	temperature sensors on the lamps
9	ambient temperature sensor (determines the speed of the fans)
13	communication with PMP
15	puls counters from fans via fan connector board (8 wires, 7 signals)

Connector	Description
17 & 18	control signals for LPS (via formatter board)
19 & 20	lens motor control
21	power supply to lamp filters

The connectors which are not mentioned are not used in this projector!

Image 5-46
Connector on the left side of the power box

connector on the left side	connector to the mains power supply

Fuse protection

Two mains fuses are mounted on a separate unit and can easily be reached.

For continued protection against fire hazard, replace always with the same type of fuses!

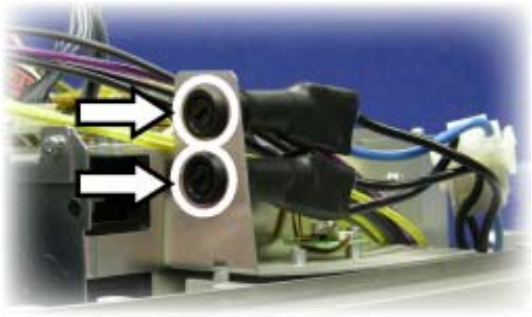


Image 5-47
Location of the fuses

5.7.2 Diagnostic LED's

Meaning of the LED's

In the opening of the power box between connectors 3 and 4, four led's are visible.

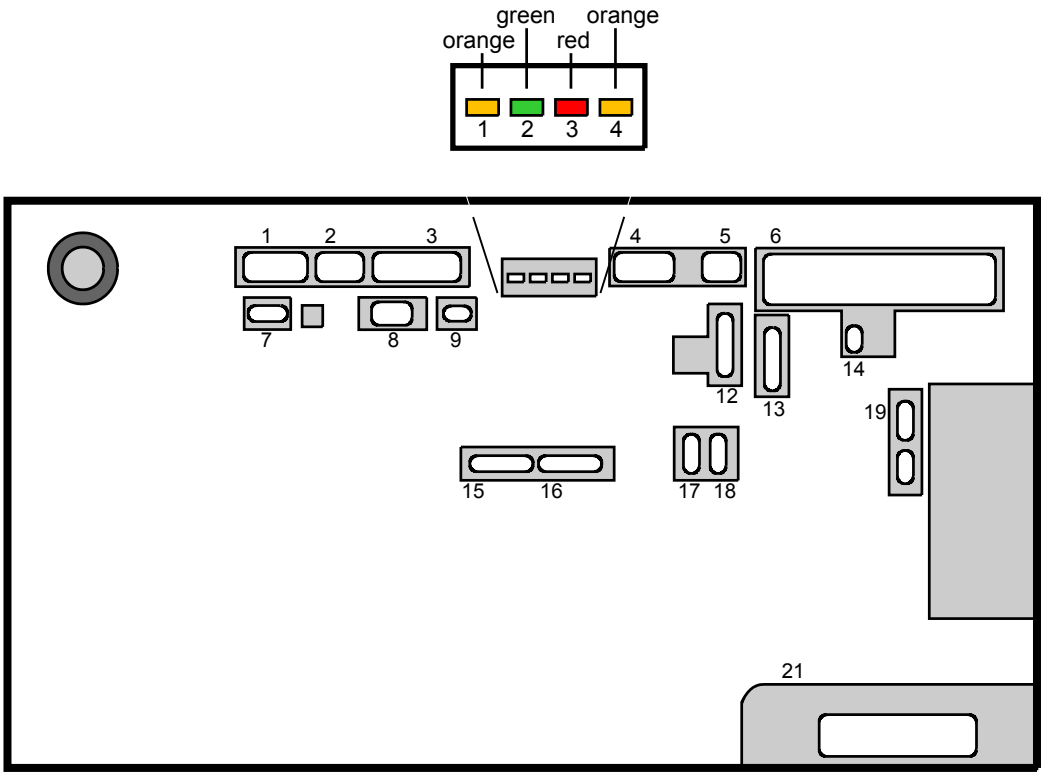


Image 5-48
Diagnostic LED's on the power box

LED number	LED color	Description
1	orange	ON when +12V is active (active state of the projector)
2	green	ON when ++12V is active (standby state of the projector)
3	red	ON if the power box sends an interrupt to the projector control and the projector control does not read this interrupt
4	orange	BLINKS (with a frequency of 1 sec) when the power box control is OK

5.7.3 Replacing the power box

Necessary tools

long screwdriver Philips Ph1

How to remove the power box?

1. Remove the PMP
2. Remove the input module
3. Remove the lamp cover
4. Loosen the four screws on the bottom of the power box. These screws are fixed to the power box and can not fall out.

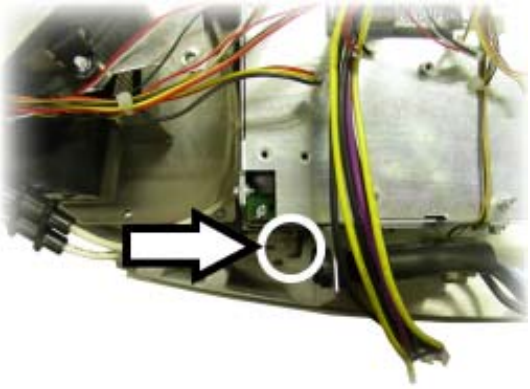


Image 5-49
Loosen the left rear screw

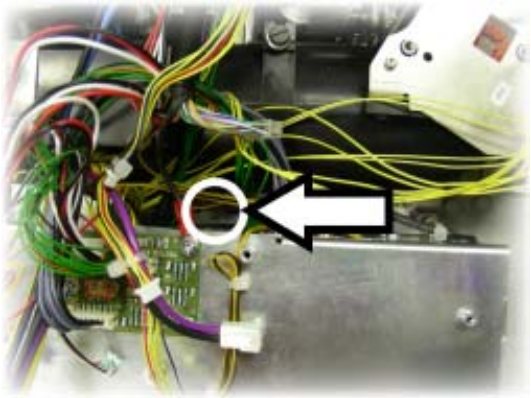


Image 5-50
Loosen the right rear screw

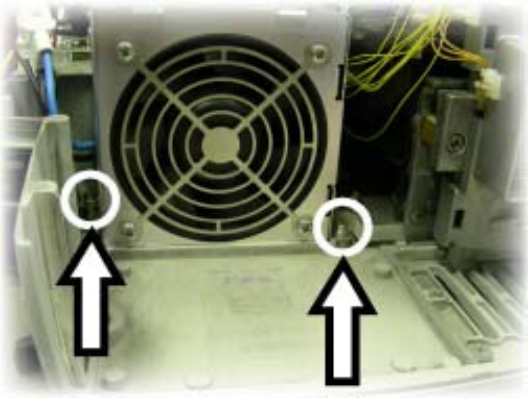


Image 5-51
Loosen both front screws

5. Disconnect the mains power connectors on the left side of the power box

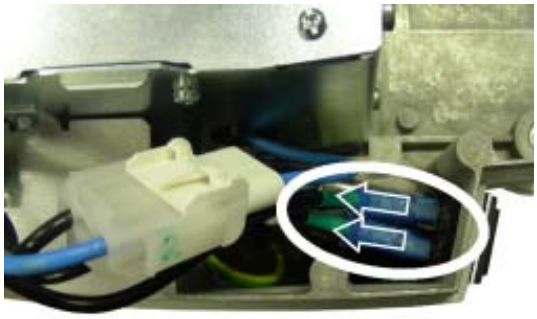


Image 5-52
Disconnect the mains power cables

6. Unplug the colored fan connectors on the fan connector board

Image 5-53
Fan connector board

7. Remove the cable strap of the lamp power cable at the rear side of the power box

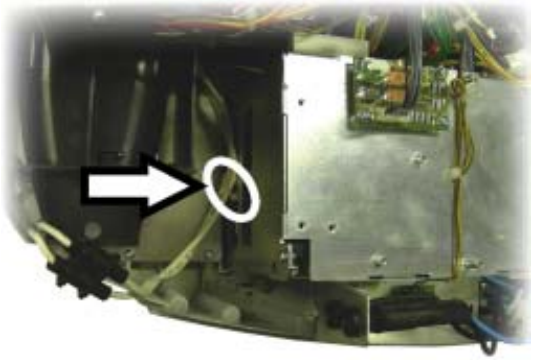


Image 5-54
Remove the cable strap of the lamp power cable

8. Shift the power box a bit forward and upward and unplug the following connectors on the right side of the power box:
   - 5: power supply for the lightpipe fan
   - 6: power supplies for the boards (++12V, +12V, +12VA)
   - 7: lamp temperature sensors
   - 9: ambient temperature sensor
   - 13: communication with PMP
   - 17 & 18: LPS control
   - 19 & 20: lens motor control
   - 21: power supply for LPS

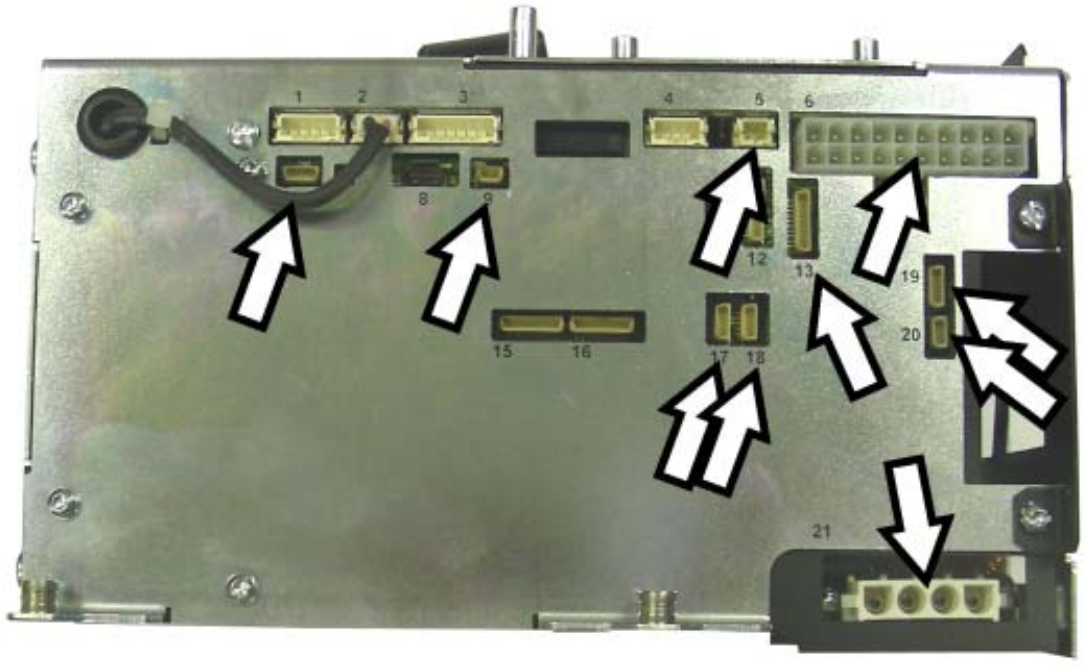


Image 5-55

9. Remove the earth cable from the fan connector board

Image 5-56
Remove the earth wire

10. Lift the power box out of the projector.

11. Unplug the connectors which are going to the fan connector board:
    - 3: power supply to fan connector board
    - 15: pulse counter from fan connector board

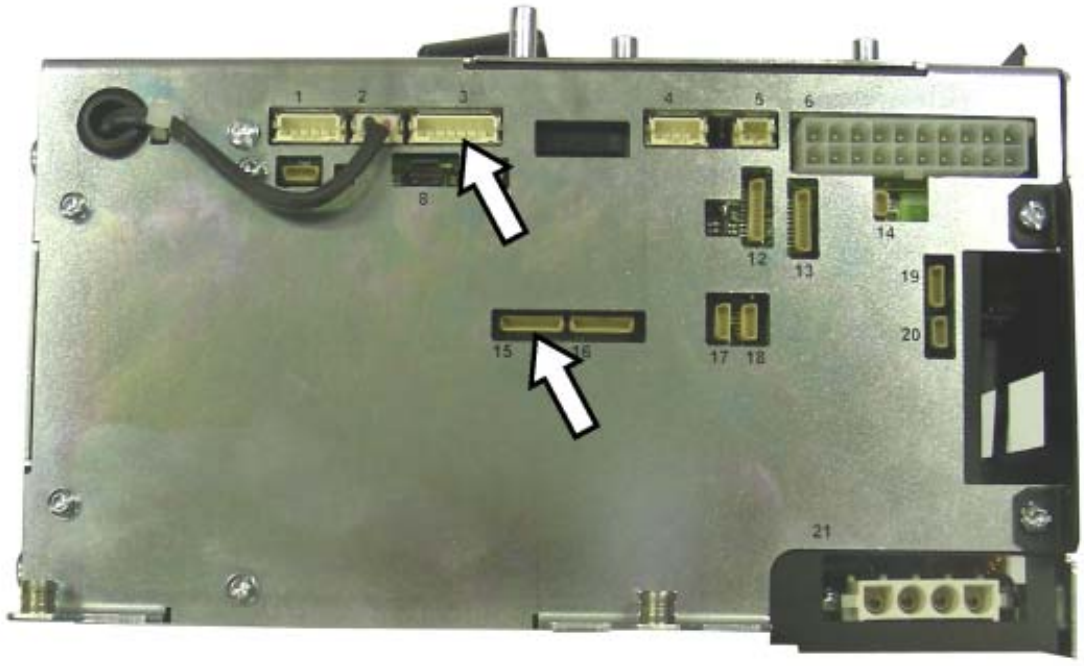


Image 5-57

12. Remove the four screws of the fan connector board

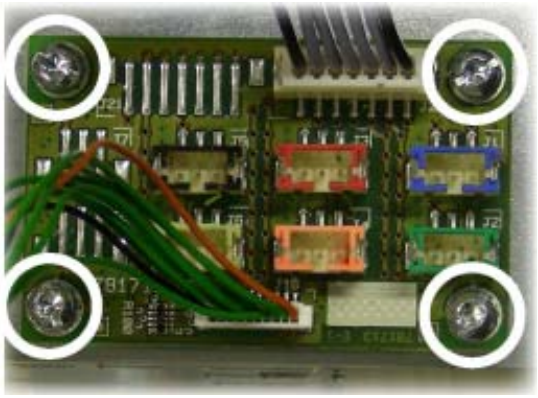


Image 5-58
Remove the four screws

13.Remove the fan connector board

14.Unplug the mains power connector

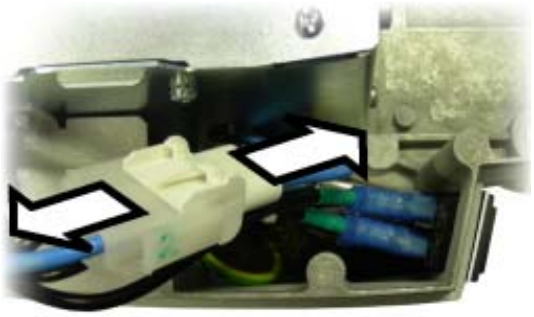


Image 5-59
Disconnect the mains power connector

5.8 The lamp power supply

Overview

- Description
- Replacing the lamp power supply
- Replacing the lamp filter

5.8.1 Description

Parts of the LPS

The LPS gets its power supply from the universal 12V power box via the lamp filters and generates the driver signal for both lamps.

A connection with the formatter board is available for synchronization reasons.

5.8.2 Replacing the lamp power supply

Necessary tools

screwdriver Torx T10

How to replace the lamp power supply

1. Remove the lamp cover
2. Remove the screw that fixes grounding connector

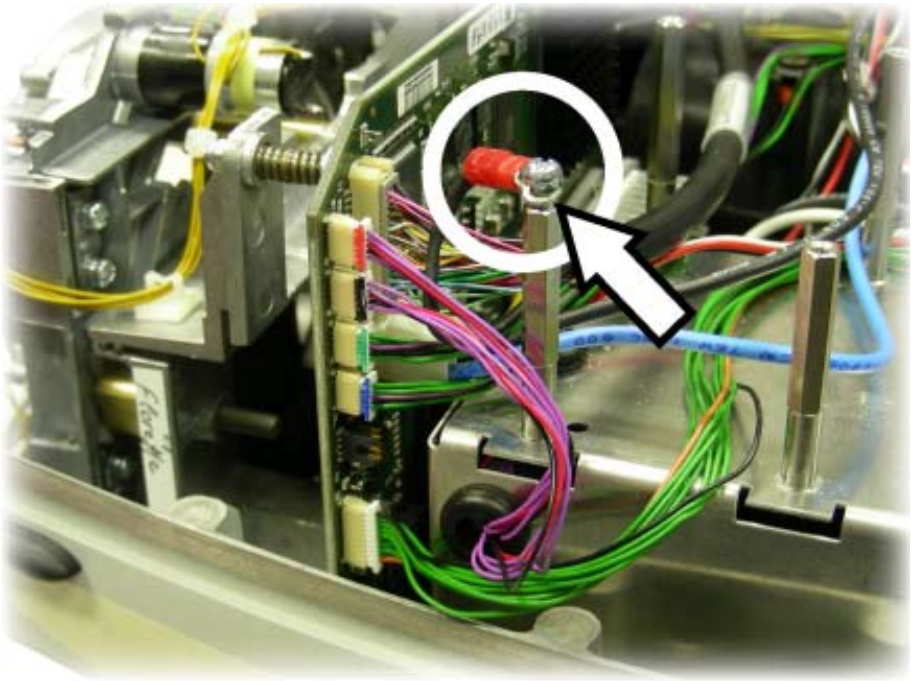


Image 5-60
Grounding connector next to formatter board

3. Remove the three connectors as described below:
   - J4 (power supply from the power box)
   - J5 (control signals for the color wheel)
   - J8 (control signal for the LPS)
   - J10 (control signal for the LPS)

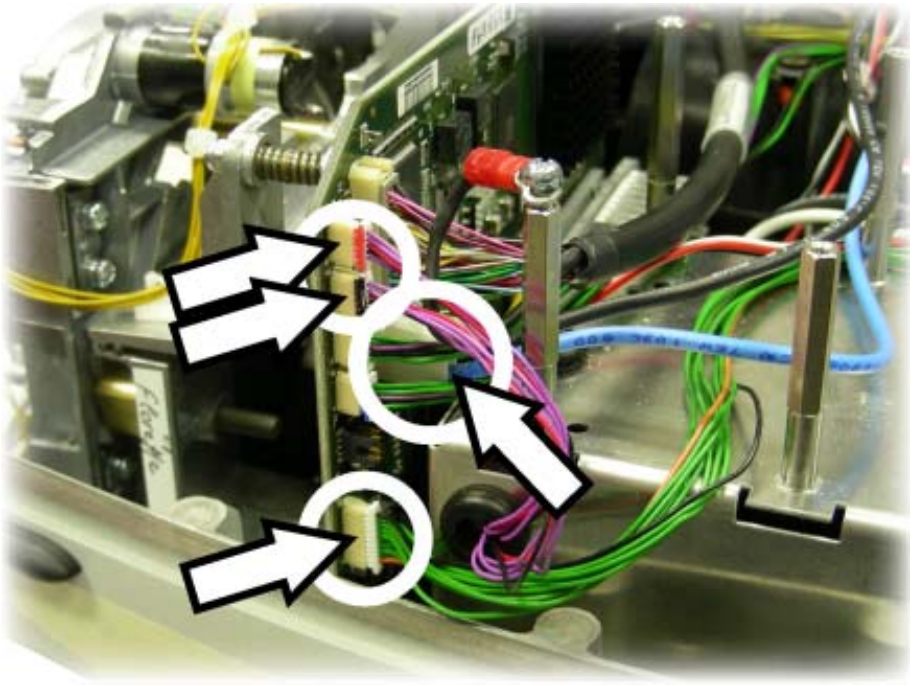


Image 5-61
Remove the indicated connectors on the formatter

4. Loosen the two screws fixing the LPS cover to the projector bottom

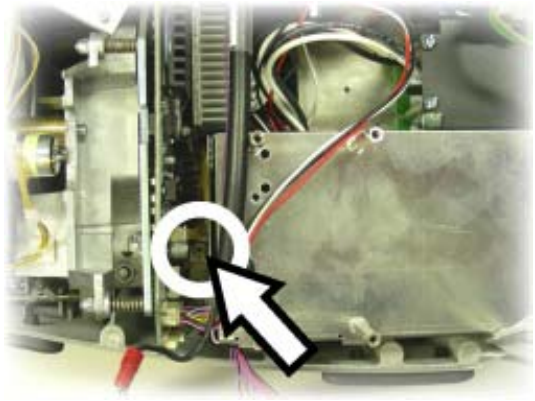


Image 5-62
Loosen the front screw of the LPS cover

Image 5-63
Loosen the rear screw of the LPS cover

5. Gently release the wires while lifting the LPS cover

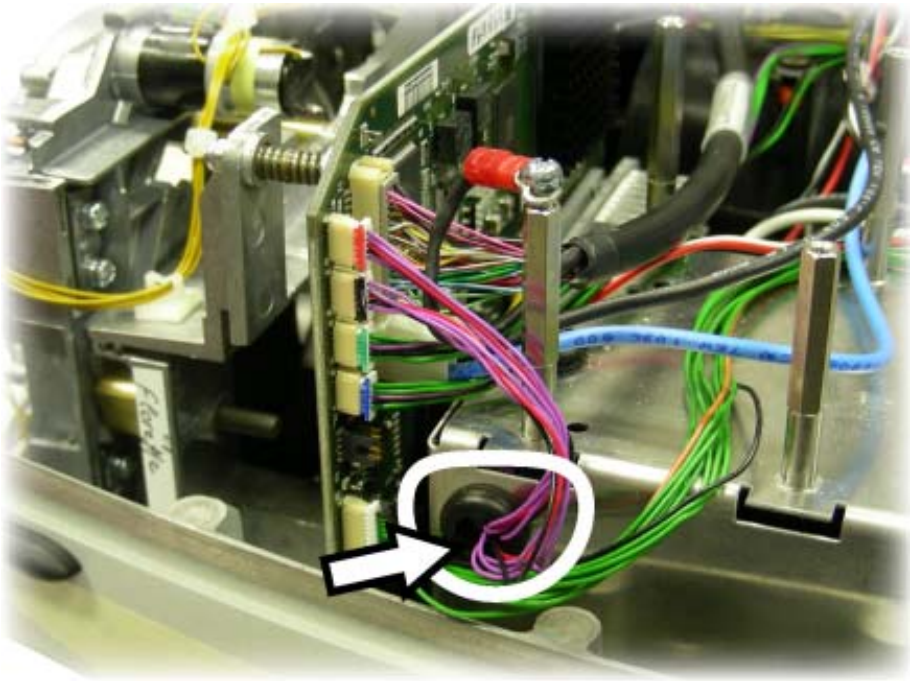


Image 5-64
Guide the wires through the hole

Image 5-65
Release the wires

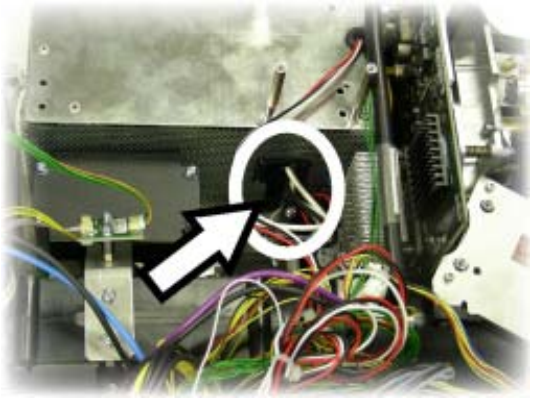


Image 5-66
Release the wires

6. Unplug the connectors as described below:
   - CJ1: power supply from the lamp filters
   - CJ2: control signals form the formatter
   - CJ4: power supply to the lamps

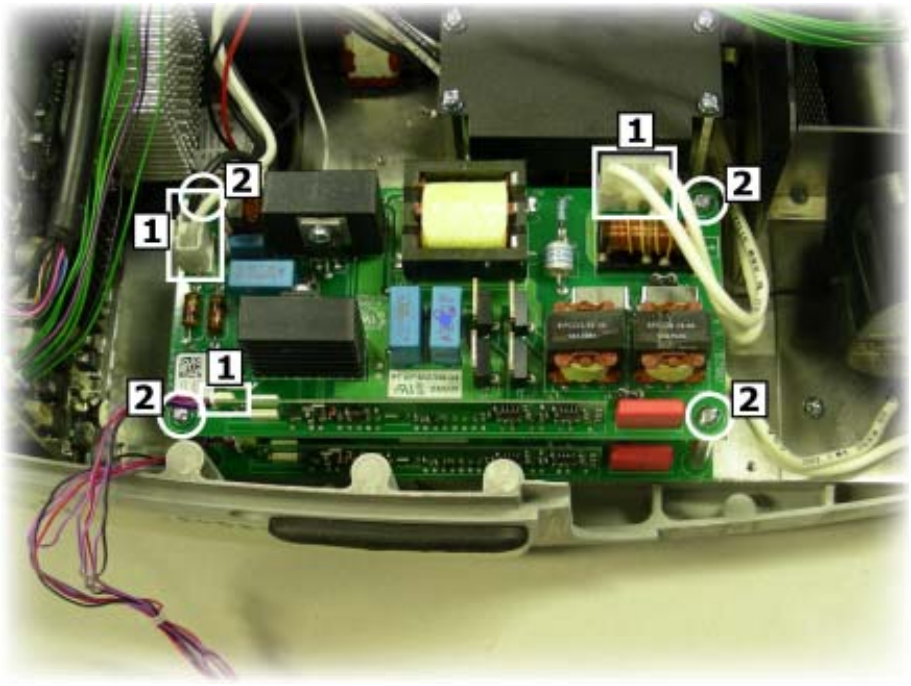


Image 5-67
1: connectors to unplug
2: screws to remove

7. Remove the four screws fixing the LPS to the projector. See image 5-67
8. Take out the LPS

5.8.3 Replacing the lamp filter

Necessary tools

screwdriver Torx T10

How to replace the lamp filter

1. Remove the lamp cover
2. Remove the four screws fixing the lamp filter cover

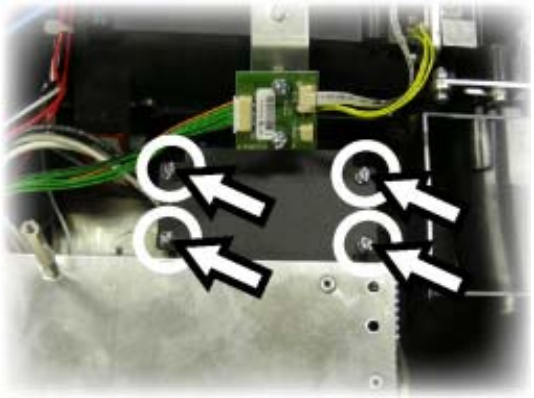


Image 5-68
Lamp filter cover screws

3. Unplug the connectors as described below:
   - J104: from the power box
   - J105: to the LPS

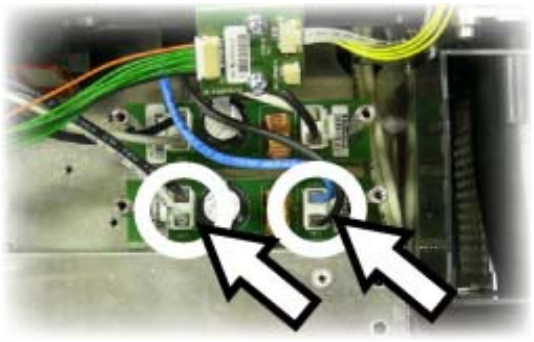


Image 5-69
Lamp filter connectors

4. Remove the fixing screws

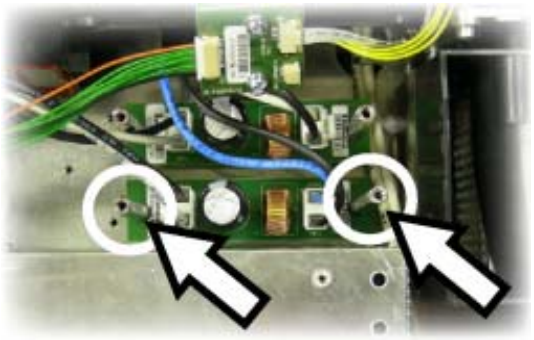


Image 5-70
Lamp filter screws

5. Remove the lamp filter

6. OPTICAL SPARES AND SERVICING PROCEDURES

Overview

- Introduction
- The UHP lamp
- The UV/IR filter
- The DLP chip
- The folding mirror
- The aspheric lens
- The light rod

6.1 Introduction

Optical path description

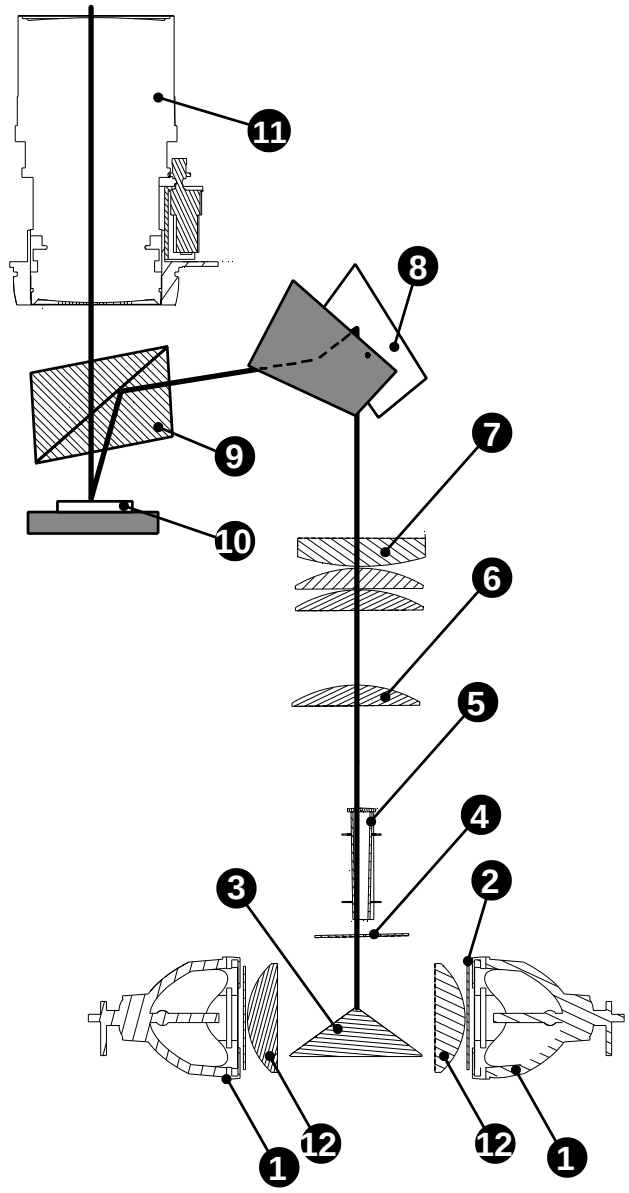


Image 6-1

Indication	Description
1	UHP lamp
2	UV/IR filter
3	prism
4	color wheel
5	light rod
6	aspheric lens
7	triplet lens
8	folding mirror
9	TIR prism
10	DLP chip
11	projector lens
12	condenser lens

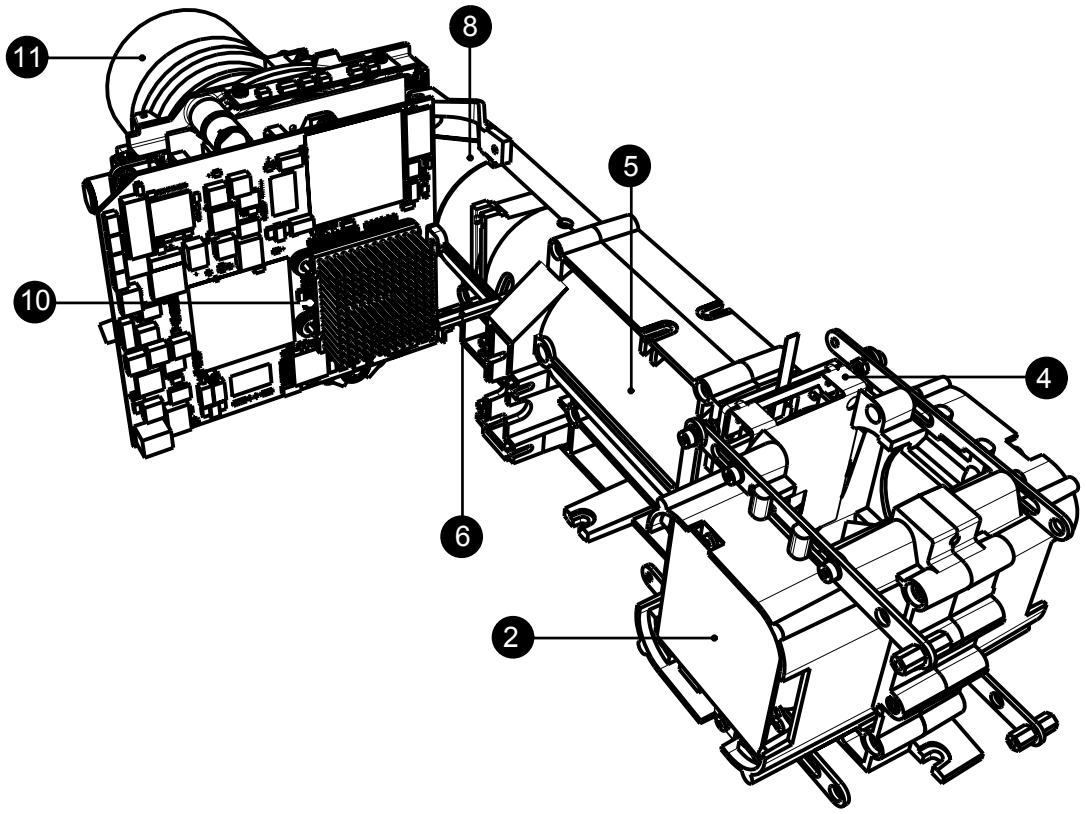


Image 6-2

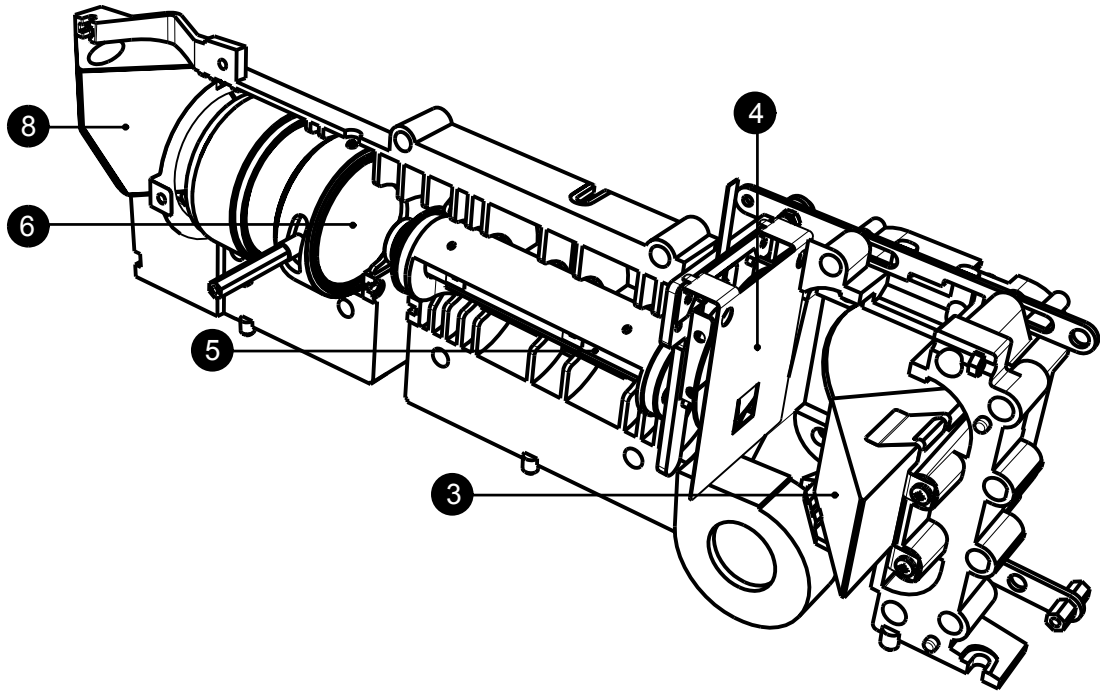


Image 6-3

6.2 The UHP lamp

WARNING: Risk of burns: wait for the projector and lamp to cool down before changing a lamp!

WARNING: Risk of explosion: changing a lamp can only be done by a Barco authorized technician.

WARNING: Risk of electrical shock: unplug the mains power cord before removing the covers.

Necessary tools

No tools.

Resetlamp runtime

Only for Barco authorized technicians! The lamp runtime may only be reset when placing a new lamp.

1. Press **MENU** to activate the tool bar.
2. Press → to select the *Lamp* menu
3. Use ↓ to pull down the *Lamp* menu
4. Use ↑ or ↓ to select *Reset runtime*
5. Press → to pull down the menu
6. Use ↑ or ↓ to select the lamp to be reset

Image 6-4

7. Press **ENTER** : a dialog box is displayed

Image 6-5

8. Use the numeric keys on the remote or ↑, ↓, ←, → to input the serial number of the lamp
9. Use ← or → to select *Accept.* The runtime will be reset and the serial number will be saved

WARNING: Lamp runtime reset can only be done by a Barco authorized technician.

Removing the lamp

Do not remove a lamp if the projector or lamp is still hot!

1. Switch off the projector and unplug the mains connection
2. Remove the back cover of the projector — See "Removing the rear cover", page 13
3. Disconnect the power plug of the lamp

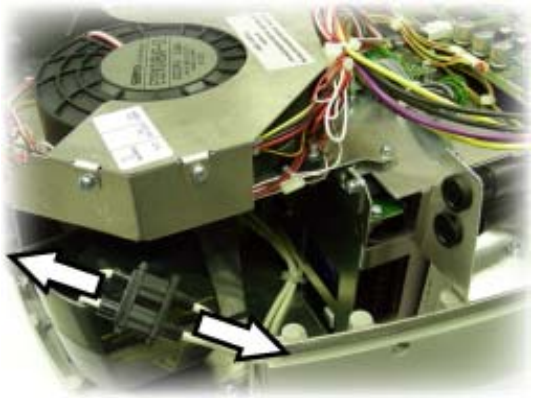


Image 6-6
Unplug the power connector of the lamp

4. Pull the lamp locking handle to unlock the lamp which you want to replace

Image 6-7
Unlock the lamp to be replaced

5. Slide out the lamp

Image 6-8
Slideout the lamp

Reverse this procedure to mount a lamp.

CAUTION: Do not touch the glass part of the lamp.

6.3 The UV/IR filter

Introduction

The UV/IR filter consists of a glass plate with a UV coating on one side and a IR coating on the other side. The side with UV coating is marked with a black dot in the corner.

How to remove the UV/IR filter?

1. Remove the lamp — See "The UHP lamp", page 67
2. Loosen (not remove) the two screws

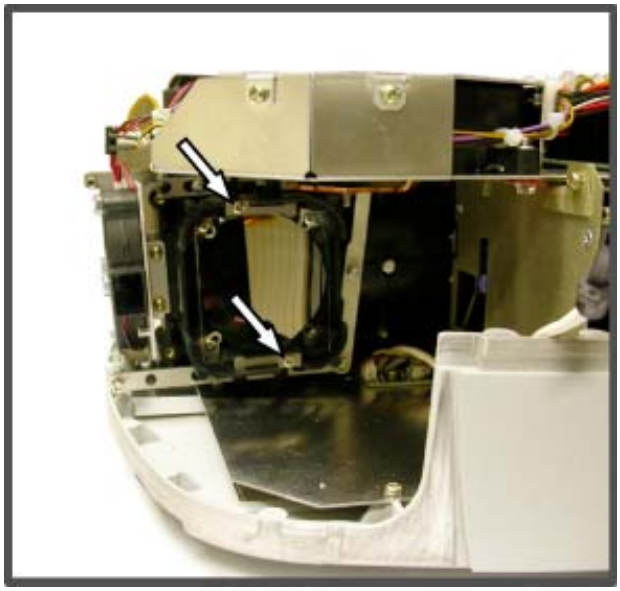


Image 6-9
Two screws holding the UV/IR filter

3. Gently remove the filter
   Caution: *Do not touch the glass surface as this will damage the filter.*

How to mount the UV/IR filter?

1. Put in the new filter with the UV coating facing the lamp

Image 6-10
UV/IR filter: indication of coated side

Tip: *The UV coated side is indicated with a black dot in the corner.*

2. Tighten the two screws slightly. Tightening them too hard may damage the filter.

6.4 The DLP chip

Overview

- DLP / formatter mounting system
- Replacing the DLP chip

6.4.1 DLP / formatter mounting system

How the DLP chip is mounted onto the formatter?

Several parts are mounted onto each other. The parts are described below:

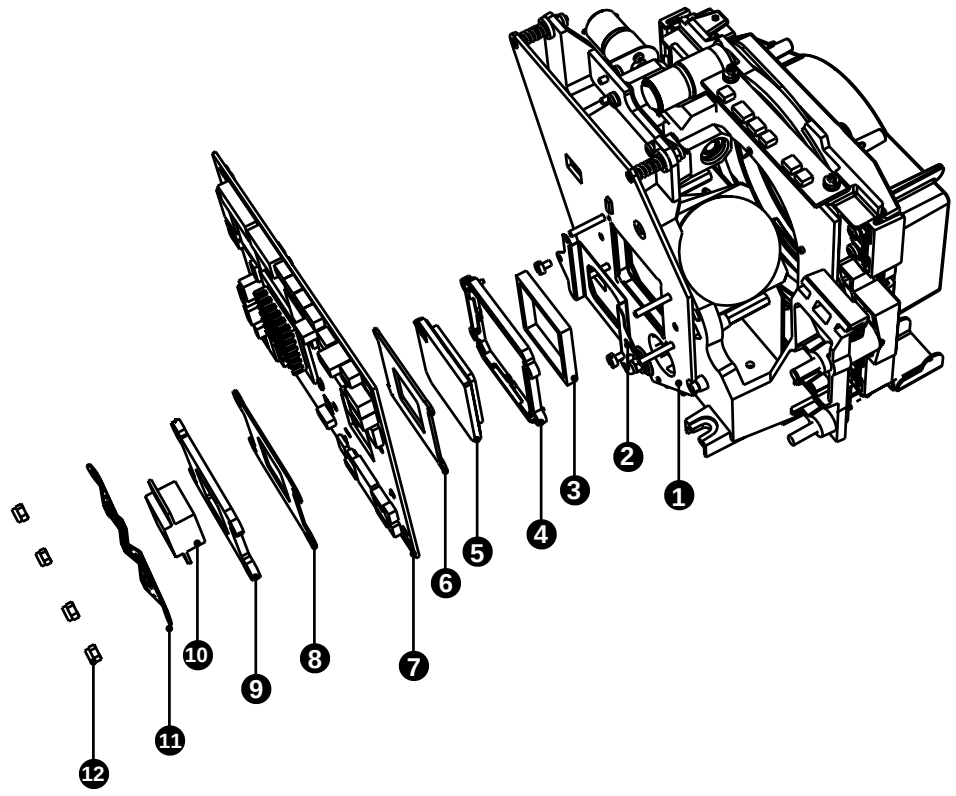


Image 6-11

Indication	Description
1	DLP fix plate
2	DLP aperture
3	DLP aperture gasket (to prevent dust from falling on the DLP chip)
4	DLP interposer
5	DLP chip
6	insulation plate
7	formatter board
8	insulation plate
9	heatsink
10	backer plate
11	stud
12	nuts (stud retainers)

6.4.2 Replacing the DLP chip

Introduction

The DLP chip replacement is a very delicate operation and must by done by trained persons only! Always carefully and attentively follow the procedures and make sure no dust or dirt can fall onto the DLP chip!

CAUTION: Always check the type of the delivered DLP chip. The formatter has to be set in order to match the new DMD!

CAUTION: Never touch the gold contacts on the chip, on the interposer or on the formatter! Fingerprints may damage the chip!

CAUTION: Never power up the projector unless you are sure that the settings of the formatter match the DMD!

It is advised to clean the contacts on the formatter with alcohol to insure good contact with the DLP chip.

Necessary tools

screwdriver Torx T10

How to remove the DLP chip?

1. Remove the formatter board — See "Replacing the formatter", page 49
2. Remove the heat sink by unscrewing the fixing screws

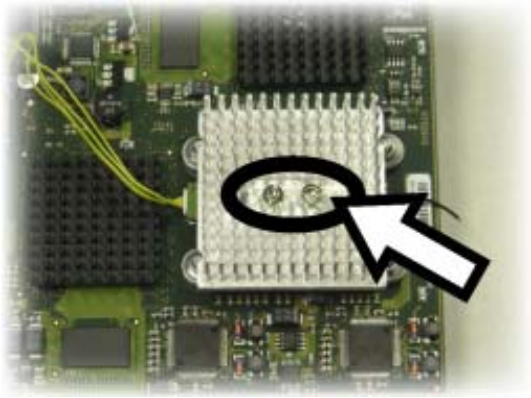


Image 6-12
Screws fixing the heat sink

3. Remove the stud by removing the fixing screws

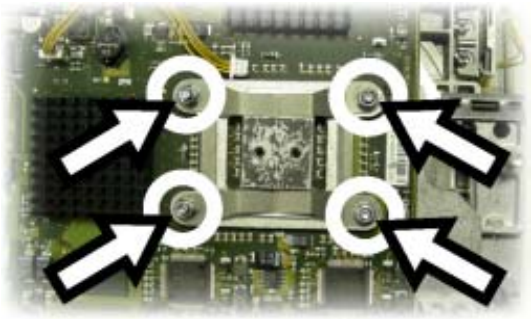


Image 6-13
Fixing screws of the stud

4. Now the DLP chip can be removed

6.5 The folding mirror

6.5.1 Description of the folding mirror

Description

The folding mirror reflects the light beam coming from the light pipe and directs it to the DMD.

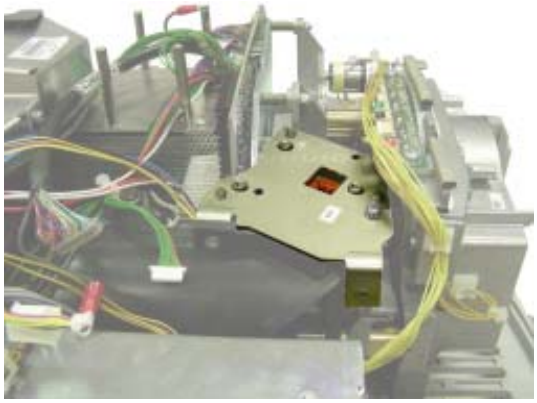


Image 6-14

6.5.2 Removing the folding mirror

Necessary tools

Torx screwdriver T10

How to remove the folding mirror?

1. Remove the top cover of the projector
2. Remove the PMP
3. Remove the three screws fixing the folding mirror

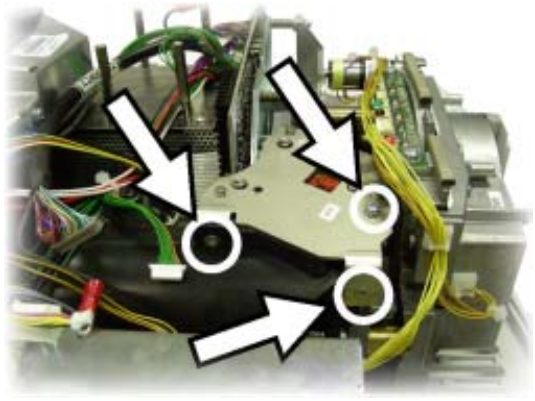


Image 6-15
Fixing screws of the folding mirror

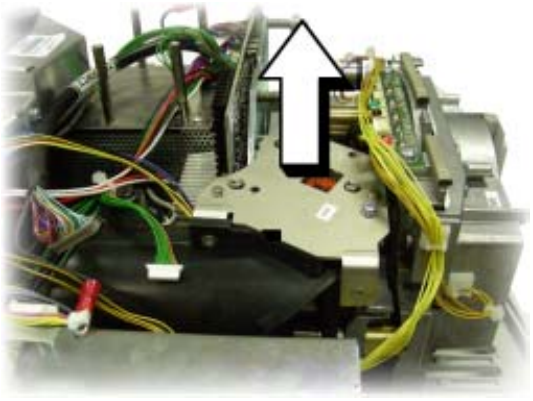


Image 6-16
Lift the folding mirror to remove it

4. Gently lift the folding mirror to remove it
   Note: *Do not touch the mirror part!*

6.5.3 Adjusting the folding mirror

Necessary tools

Allen key 2 mm

Misalignment of the folding mirror

A black border or a black area in a corner of the projected image can be caused by a misalignment of the folding mirror. This black area can be found at any side of the image, depending on the position of the folding mirror.

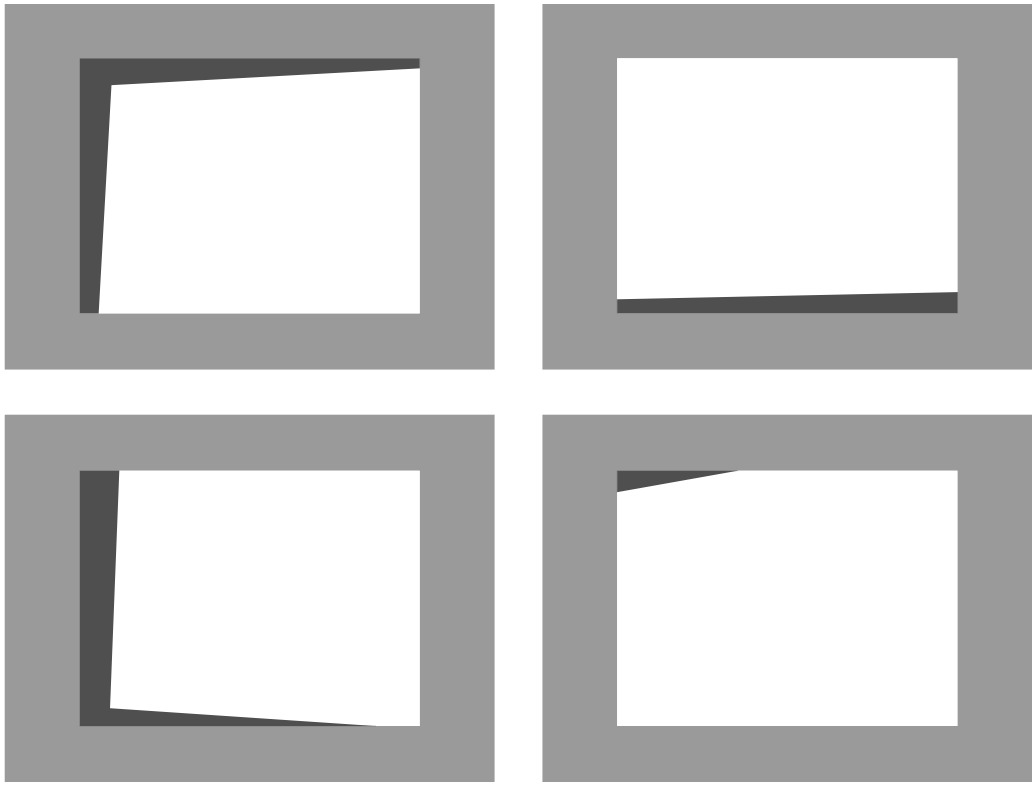


Image 6-17
Examples of misalignment of the folding mirror

CAUTION: Bad alignment of the folding mirror can cause damage to the lens or to the seals on the DMD!

Overview of adjusting possibilities of the folding mirror

This overview only applies to a front table configuration and describes what is seen on the screen.

When the image is shifted in one direction, a black border appears at the opposite side

The adjusting screws are sealed with glue: before trying to turn the screws, warm up the glue using a hair dryer until it becomes weak. Now the screw can be turned without risk of breaking off the screw head.

The nominal position of the folding mirror is the position where the top plate of the folding mirror is at the same level as the top of the three studs.

Image 6-18

If you shift the image up and left, dark borders will appear at the bottom and at the right side.

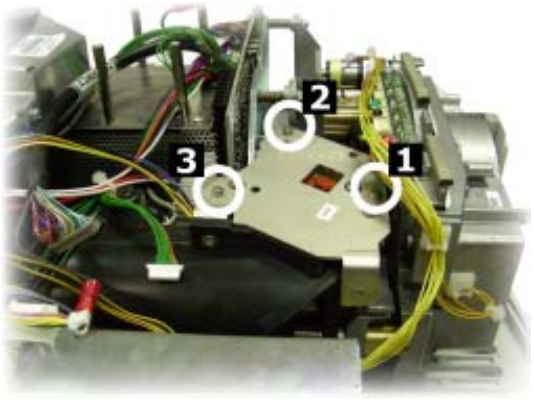


Image 6-19
Screws to adjust the folding mirror

- screw 1:
  - clockwise: image shifts down and left
  - counterclockwise: image shifts up and right
- screw 2:
  - clockwise: image shifts down and right
  - counterclockwise: image shifts up and left
- screw 3:
  - clockwise: image shifts up
  - counterclockwise: image shifts down

How to adjust the folding mirror?

We assume the light rod and the aspheric lens to be well aligned! This procedure is described for front table configuration!

1. Select a full white pattern to be projected
2. Adjust screws 1, 2 and 3 to put the folding mirror in nominal position

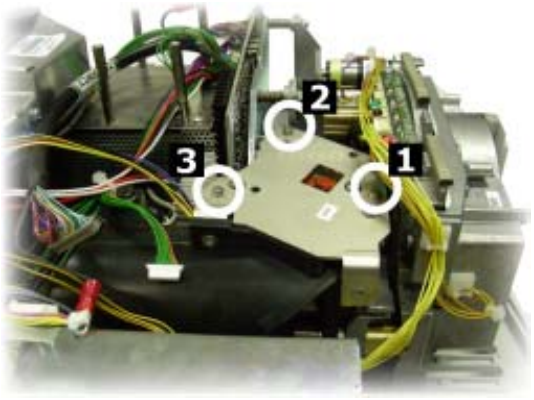


Image 6-20
Adjusting screws of the folding mirror

3. Use screws 1, 2 and 3 to shift the image on the DMD: no more black borders may be seen on the screen

6.6 The aspheric lens

6.6.1 Description of the aspheric lens

Description

The aspheric lens adjusts the focus of the light beam on the DMD. The aspheric lens is pre-adjusted in the factory.

The position of the aspheric lens is locked by a securing screw.

6.6.2 Adjusting the aspheric lens

Necessary tools

Allen key 1.5 mm

How to adjust the aspheric lens?

1. Select a full white pattern to be projected
2. Adjust screw 3 of the folding mirror to shift down and right the image, until a black corner becomes visible

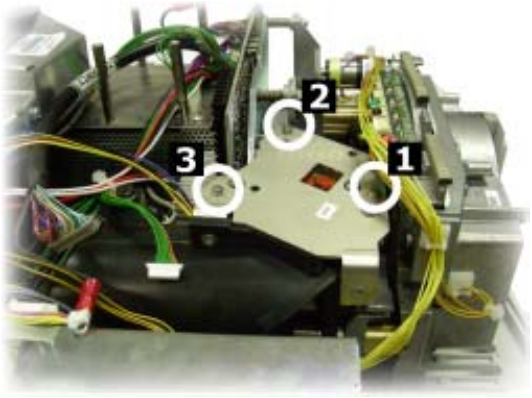


Image 6-21
Adjustment screws of the folding mirror

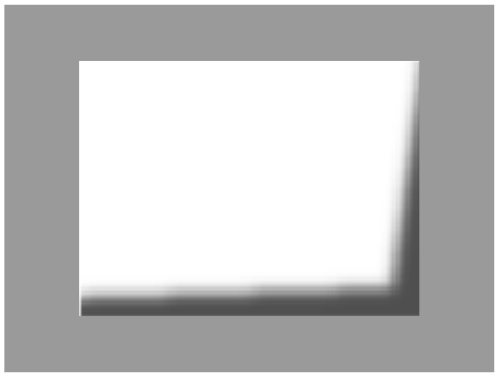


Image 6-22

Note: *If the edge of the black area is a sharp line, the asperic lens is well aligned!*

3. Release the securing screw of the aspheric lens

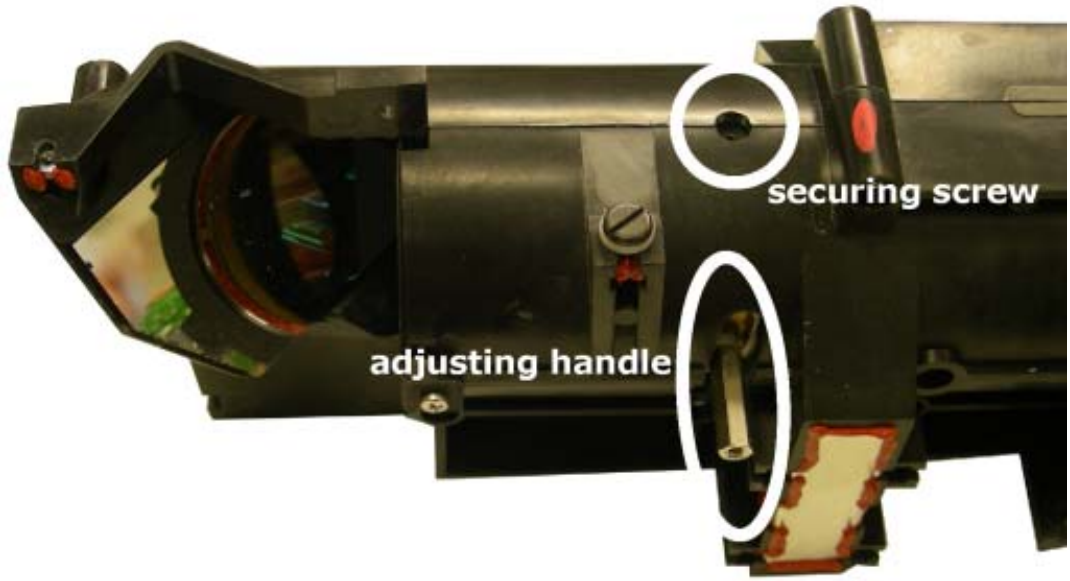


Image 6-23

4. Move up or down the adjusting handle until the edge of the black area becomes a sharp line

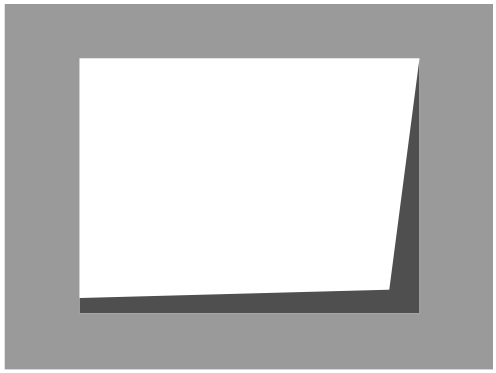


Image 6-24
Securing screw and adjustment handle of the a-spheric lens

5. Tighten the securing screw of the aspheric lens
6. Readjust the folding mirror to make the black area disappear

6.7 The light rod

6.7.1 Description of the light rod

Description

The light rod is a piece of solid glass which aligns the light beam coming from the lamps. The section of the light rod corresponds to the aspect ratio of the DMD.

A small rotation of the light rod can be performed, to align the light beam on the DMD. The position of the light rod is locked by two securing screws.

6.7.2 Alignment of the light rod

Necessary tools

- Allen key 2.5 mm
- nut spanner 5.5 mm

Misalignment of the light rod

When the light rod is not well aligned, you can see a rotation of the image.

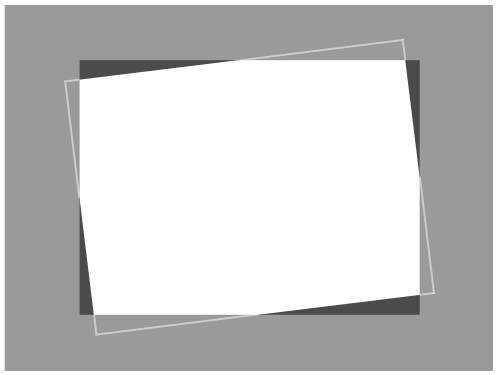


Image 6-25

How to align the light rod?

1. Switch off the projector
2. Remove the lamp cover
3. Remove the left lamp — See "The UHP lamp", page 67
4. Release the two securing screws

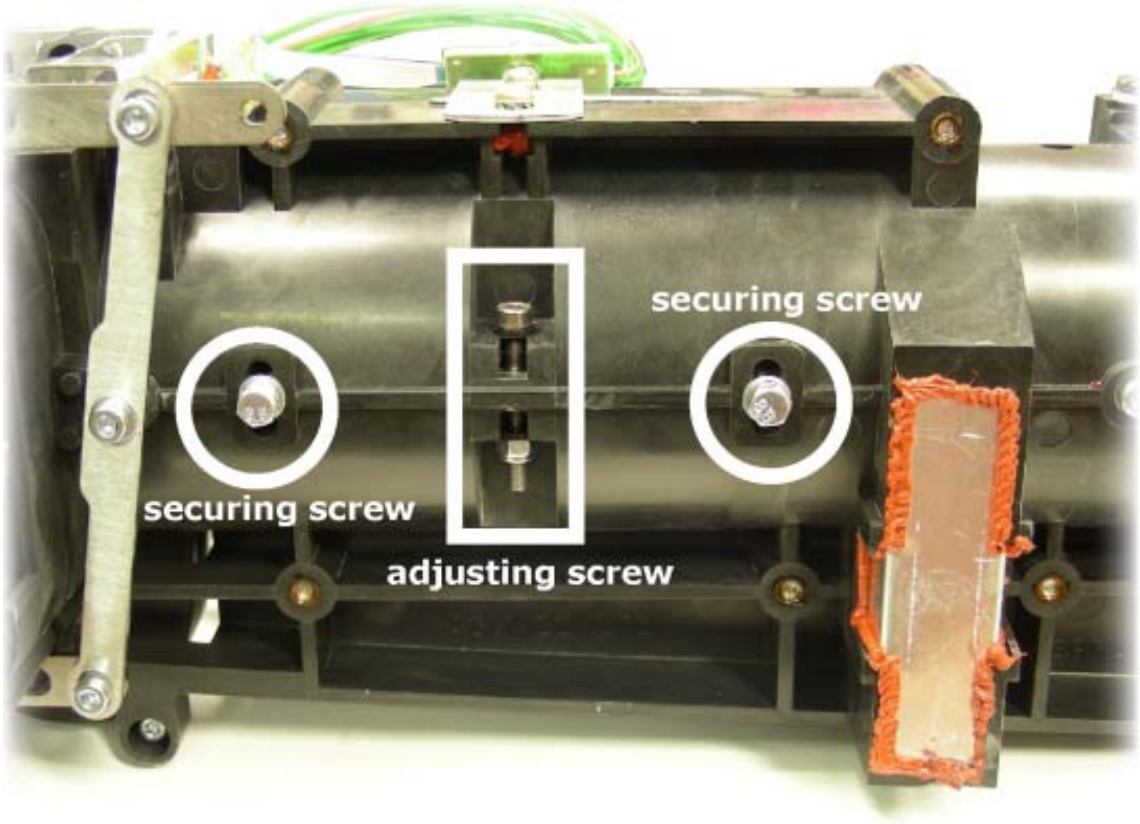


Image 6-26

5. Mount the lamp cover and the lamp
   Caution: *If you do not mount the lamp cover before starting the projector, the lamps can explode!*
6. Select a full white pattern to be projected
7. Turn the adjustment screw until the light beam is aligned on the DMD. This screw can be reached through a whole in the lamp cover

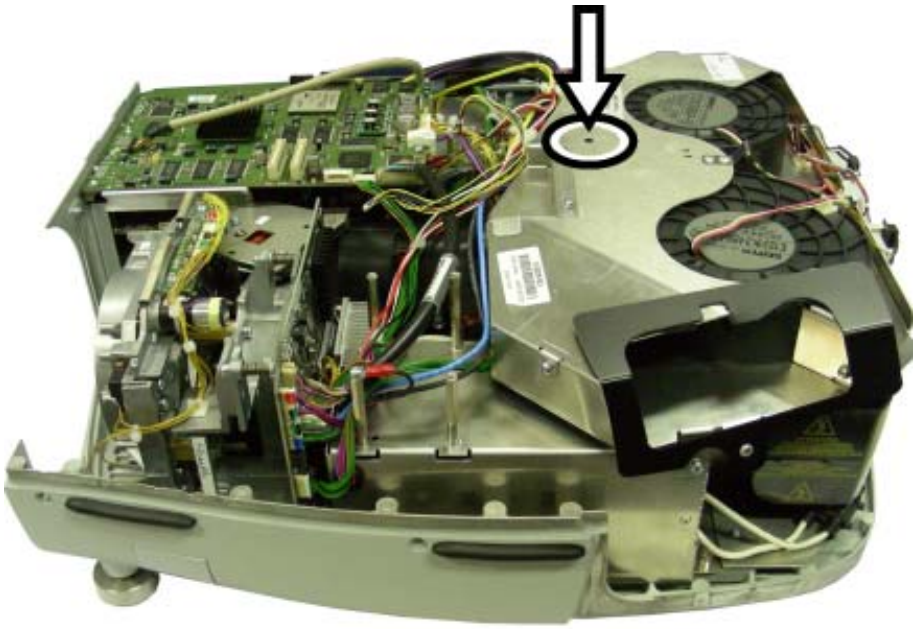
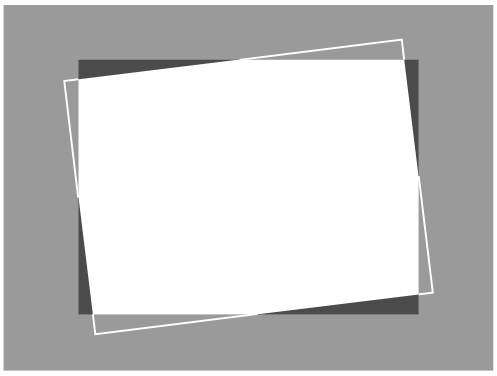


Image 6-27
Whole in the lamp cover to reach the adjustment screw of the lightrod



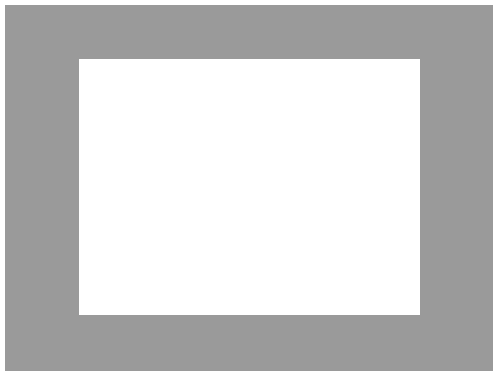


Image 6-28

8. Switch off the projector
9. Remove the lamp cover and the right lamp
10. Tighten the securing screws
11. Mount the lamp cover and the lamp back again

7. MECHANICAL SPARES AND SERVICING PROCEDURES

Overview

- The color wheel and sensor
- The lens shift motor
- Fans and temperature sensors
- The lens holder
- Dust filters

7.1 The color wheel and sensor

Overview

- Description
- Replacing the color wheel
- Color Wheel Index
- Replacing the color wheel sensor
- Replacing the color wheel connection board

7.1.1 Description

Spoke

The spoke of a color wheel is the transition line between two different color segments.

RGBW color wheel

Color wheel with a red, a green, a blue and a white segment.

RGBRGB color wheel

Color wheel with two red, two green and two blue segments.

The projector type H250 has a RGBRGB color wheel, the projector type H400 (H500) has a RGBW color wheel.

Description of the color wheel

The color wheel is driven by a motor. The speed of the motor is controlled accurately by a locked loop and linear current control. The revolution speed is three times the frame rate of the displayed image.

The position of the color wheel is detected by the sensor, which detects a black mark on the motor shaft.

This speed control and position detection makes it possible to accomplish a perfect synchronization of color wheel, lamp and DMD reset driver.

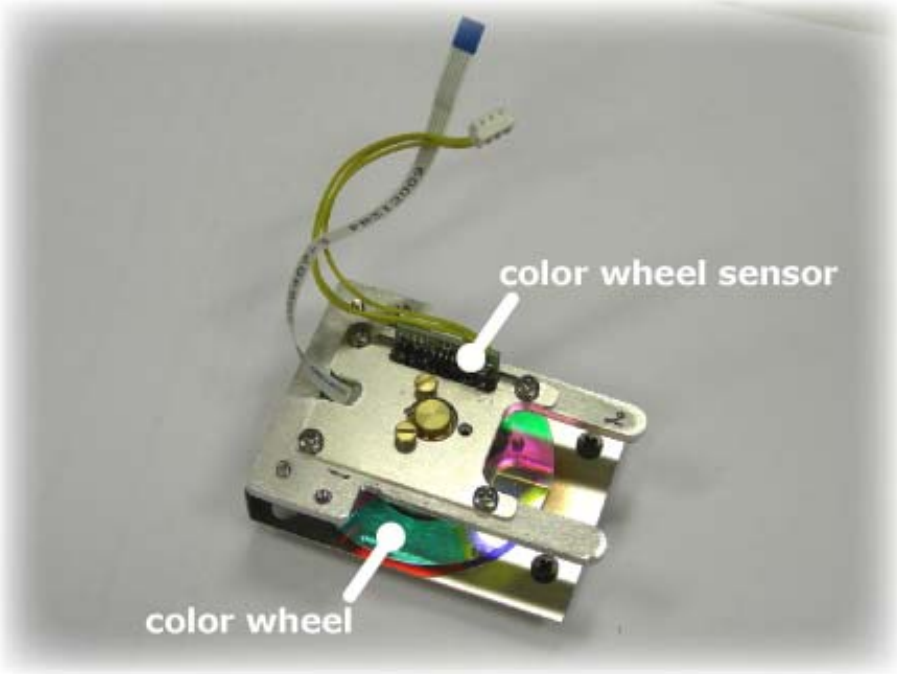


Image 7-1
The color wheel

7.1.2 Replacing the color wheel

Necessary tools

screwdriver Torx T10

How to remove the color wheel?

1. Remove the lamp cover
2. Disconnect the color wheel from the interconnection unit.

Image 7-2
Disconnect the flat cable

Caution: *Be very careful when disconnecting the flat cable: gently pull out the connector lock*

3. Unplug connector J103 on the interconnection unit (wires to the color wheel sensor)

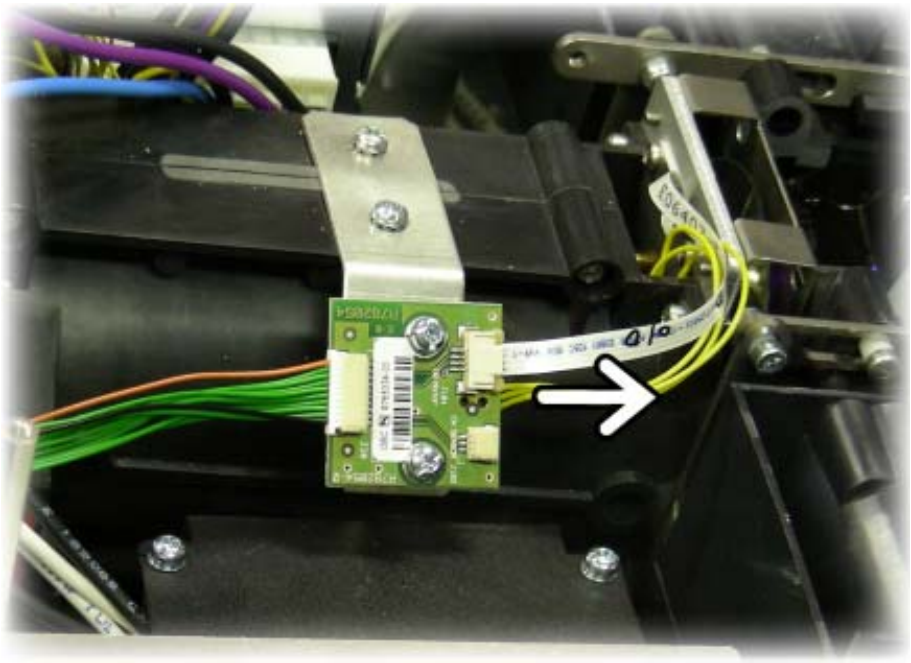


Image 7-3
Disconnect the color wheel sensor

4. Remove the two screws fixing the color wheel to the optical frame

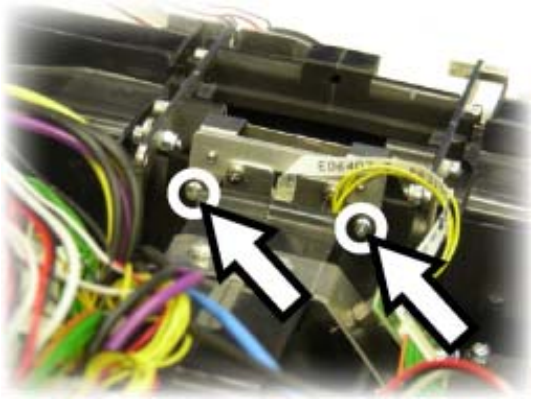


Image 7-4
Fixing screws of color wheel

5. Gently lift the color wheel assembly to remove it. Do not touch the glass parts.

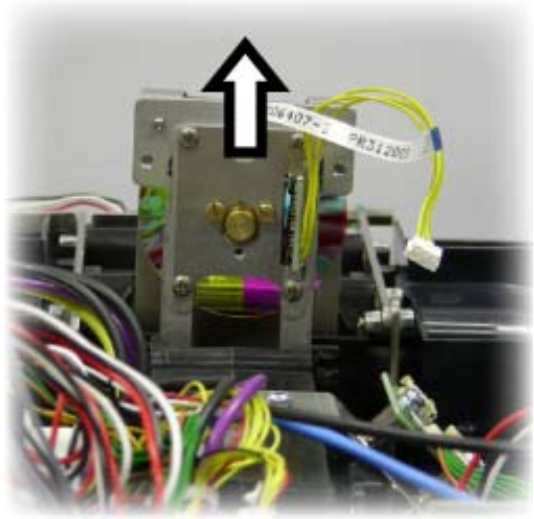


Image 7-5
Lift the color wheel out of the optical frame

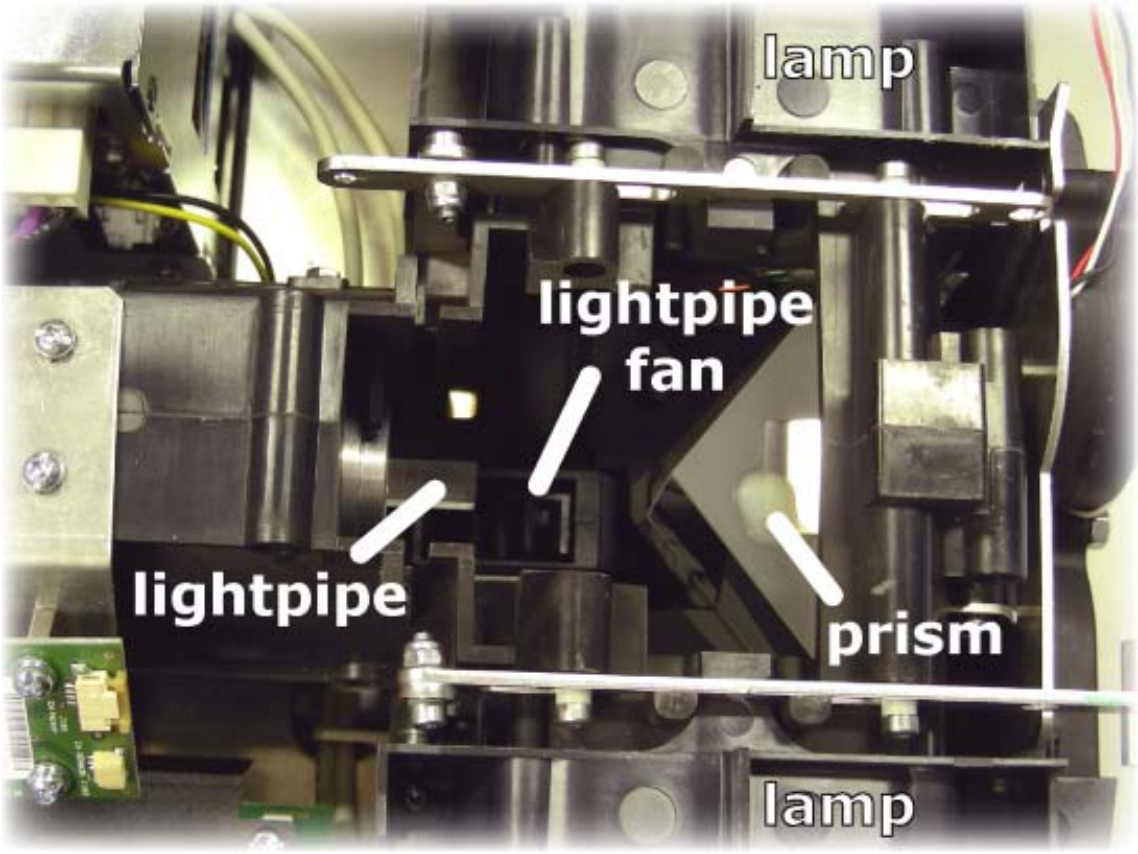


Image 7-6
The color wheel removed

7.1.3 Color Wheel Index

CAUTION: Changing these settings may seriously affect the performance of the projector, return to the factory setting by pressing Factory Preset CWI.

What can be done?

This adjustment has to be done by qualified service personnel when a new color wheel is installed.

How to set the Color Wheel Index?

1. Press the **MENU** key to activate the Menu bar.
2. Push the cursor key ← or → to highlight *Installation* in the menubar.
3. Push the ↓ key to pull down the *Installation* menu.
4. Push the cursor key ↑ or ↓ to highlight *Color Wheel Index* and press **ENTER** to select.

Image 7-7

Tip: *Press the **LOGO** key to display a full white pattern.*

The Color Wheel Index bar scale will be displayed.

Image 7-8

5. Use the cursor key ← or → , the numeric keys on the RCU, or the local keypad, to adjust the Color Wheel Index, confirm with **ENTER**.
6. Press **BACK** to return to the *Installation* menu.

7.1.4 Replacing the color wheel sensor

Necessary tools

- screwdriver Philips Ph1
- nutspanner 5mm

How to remove the color wheel sensor?

1. Remove the color wheel — See "Replacing the color wheel", page 82
2. Remove the two bolts fixing the sensor to the color wheel assembly
   Caution: *Each of these bolts have a nut screwed on it!*

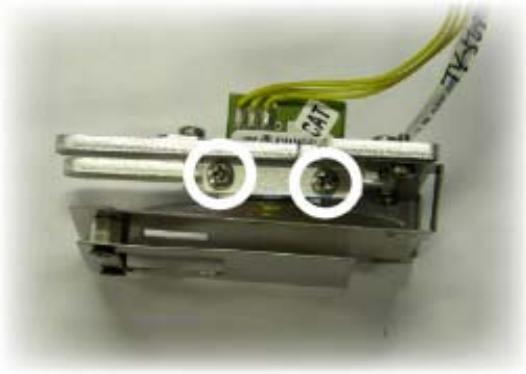


Image 7-9
Fixing bolts of the color wheel sensor

Image 7-10
Nuts on the fixing bolts of the color wheel sensor

3. Remove the color wheel sensor

7.1.5 Replacing the color wheel connection board

Necessary tools

screwdriver Torx T10

How to remove the color wheel connection board?

1. Remove the lamp cover
2. Unplug the connectors as described below:
   - J101: color wheel motor
   - J103: color wheel sensor
   - J38: control signals from the formatter board

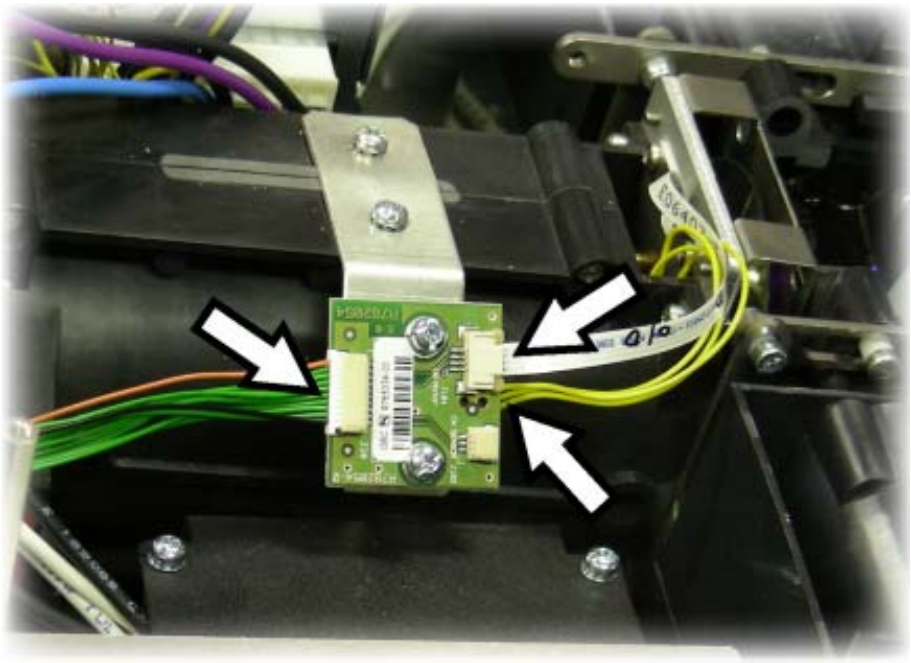


Image 7-11
Connectors on the color wheel connection board

3. Remove the two screws fixing the color wheel connection board

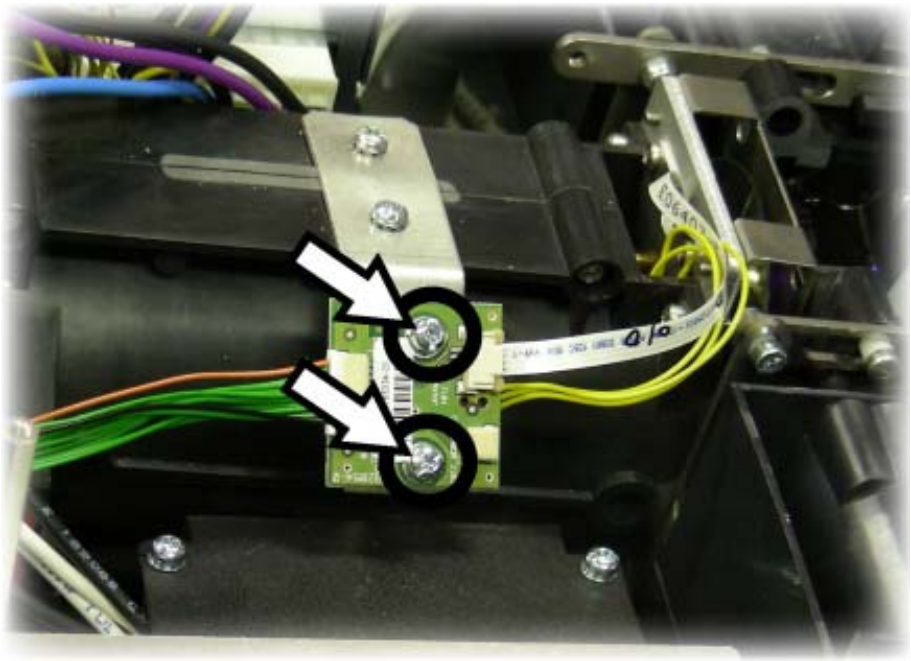


Image 7-12
Screws fixing the color wheel connection board

4. Remove the color wheel connection board

7.2 The lens shift motor

Description

The lens shift motor receives its commands via the motor connector board. This motor moves up and down the lens (vertical lens shift).

Image 7-13
Location of the lens shift motor

How to remove the lens shift motor?

1. Unplug connector J5 on the motor connector board

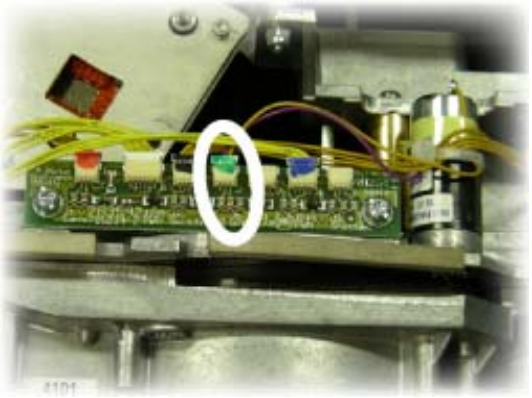


Image 7-14
Connector to the lens shift motor

2. Remove the two screws (“A”) fixing the lens shift motor to the lensholder

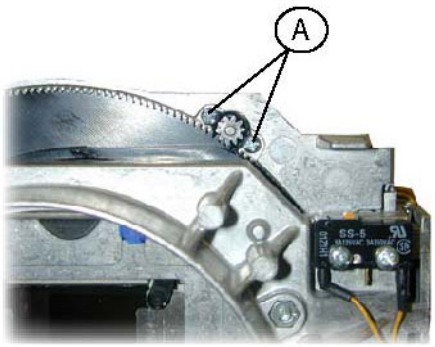


Image 7-15
A: screws fixing the lens shift motor
Note: *If the lens position is too high, one can not reach the fixing screws and the lens holder must be taken apart.*

3. Slide out the lens shift motor

7.3 Fans and temperature sensors

Overview

- Fans
- Replacing the lamp fans
- Replacing the lamp top fans
- Replacing the power box fan
- Removing the LPS fan
- Replacing the light pipe fan
- Replacing the DMD fan
- Replacing the PMP fan
- Temperature sensors

7.3.1 Fans

Fan overview

The fans in the projector are controlled by the control board in the power box. There are five groups, each group with its specific control parameters.

The fan connector board has a connector for every fan. Power supply and control signals are coming from the power box and also arrive on the fan connector board.

Some fans have a small additional interconnection board.

Fan name	Connector
fan lamp 1	J1 on fan connection board
fan lamp 2	J2 on fan connection board
fan top lamp 1	J5 on fan connection board
fan top lamp 2	J3 on fan connection board
fan power box	connector 2 on the power box
fan LPS	J6 on fan connection board
fan light pipe	J32 on interconnection board on projector frame, next to the light pipe
fan DMD	J4 on fan connection board
fan PMP	J7 on fan connection board

Fan location

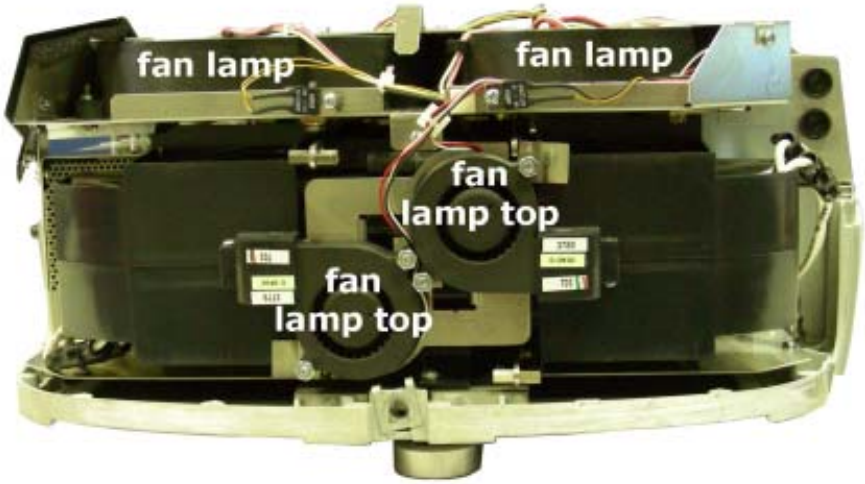


Image 7-16
Location of **fan lamp** and **fan lamp top**

Image 7-17
Location of **fan LPS**

Image 7-18
Location of **fan power box**

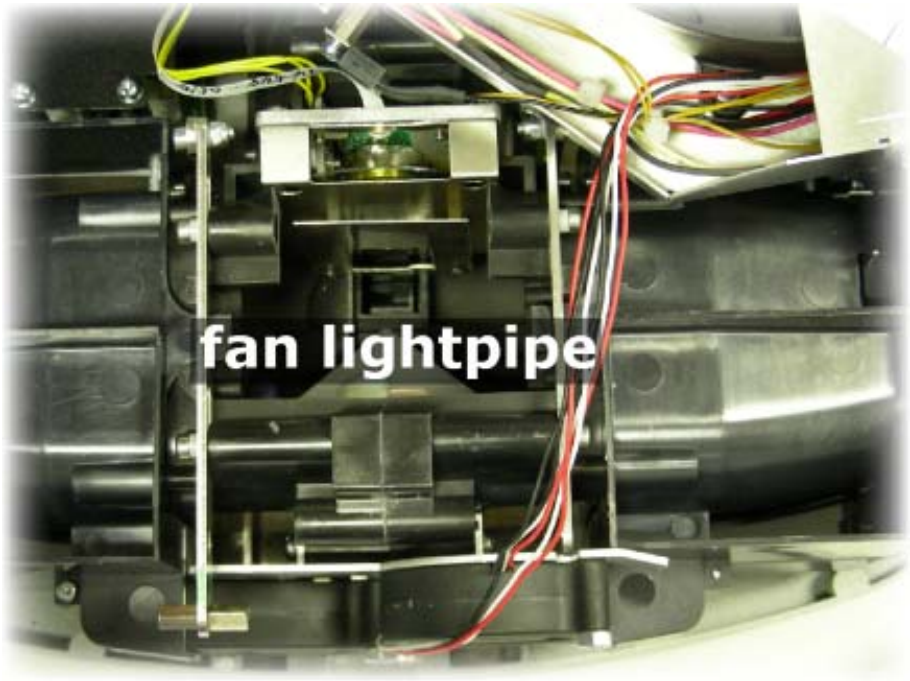


Image 7-19
Location of **fan light pipe**

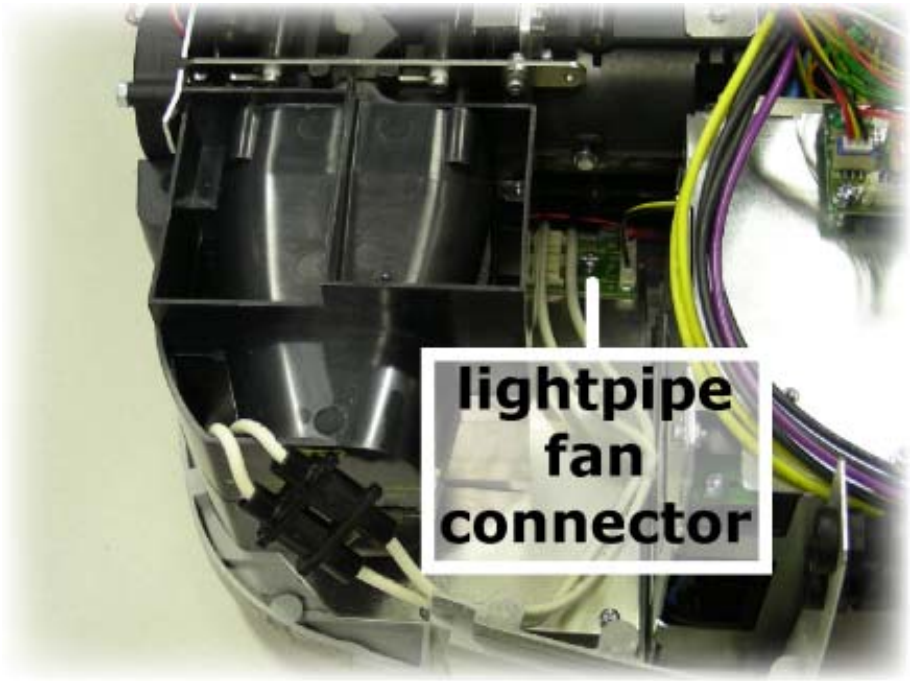


Image 7-20
Location of the **light pipe fan connector**

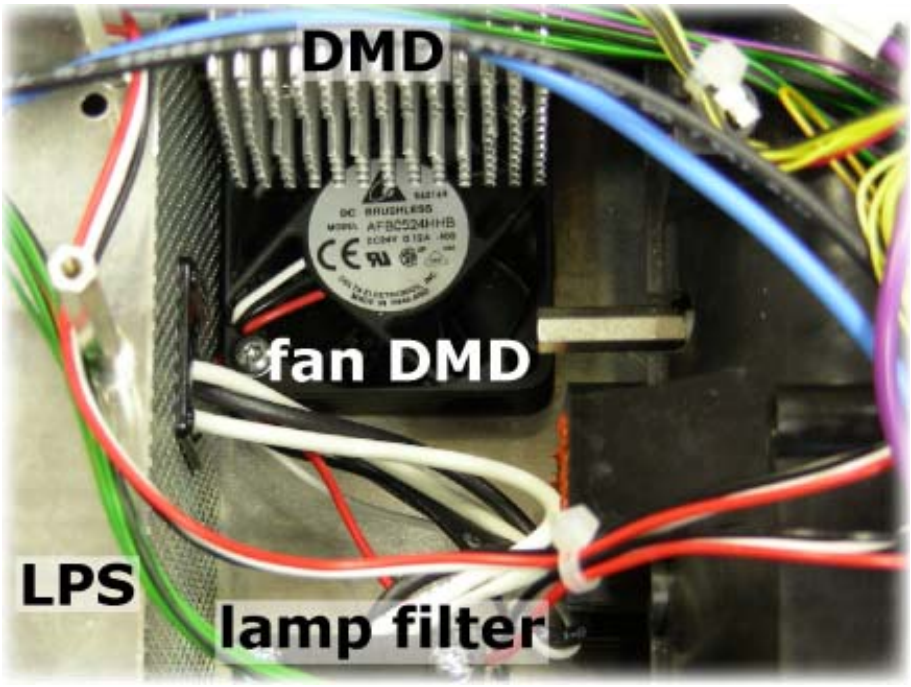


Image 7-21
Location of the **fan DMD**

Image 7-22
Location of the **fan PMP** on top of the power box

Image 7-23
Location of the **fan connector board**, on top of the power supply

7.3.2 Replacing the lamp fans

Necessary tools

- screwdriver Torx T10
- slotted screwdriver 6mm

How to remove the lamp fans?

1. Remove the lamp cover
2. Unplug the fan connector (J1 of J2 on the fan connector board)
3. Remove the three screws fixing the lamp fan to the lamp cover. Beware of the nuts!

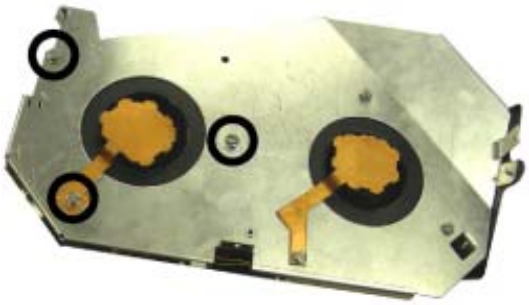


Image 7-24
Fixing screws of lamp cover fan

4. Slide out the fan to remove it

7.3.3 Replacing the lamp top fans

Necessary tools

nut spanner 7mm

How to remove the lamp top fans?

1. Unplug the fan connector (J3 of J 5 on the fan connector board)
2. Remove the nuts fixing the fan to the projector

Image 7-25
Nuts fixing the lamp top fans

3. Remove the fan

7.3.4 Replacing the power box fan

Necessary tools

screwdriver Philips Ph2

How to remove the fan of the power box?

1. Remove the power box — See "Replacing the power box", page 54
2. Unplug the fan connector (2 on the power box)
3. Remove the four screws fixing the fan and the grid

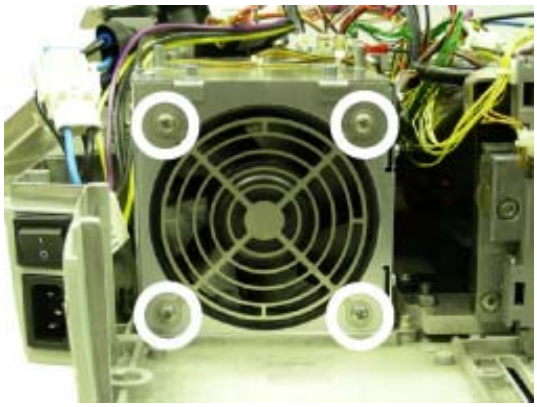


Image 7-26
Screws fixing the power box fan and grid

4. Slide out the fan to remove it

7.3.5 Removing the LPS fan

Necessary tools

screwdriver Philips Ph2

How to remove the LPS fan?

1. Remove the LPS cover — See "Replacing the lamp power supply", page 59
2. Unplug the fan connector (J6 on the fan connector board)
3. Remove the four screws fixing the LPS fan

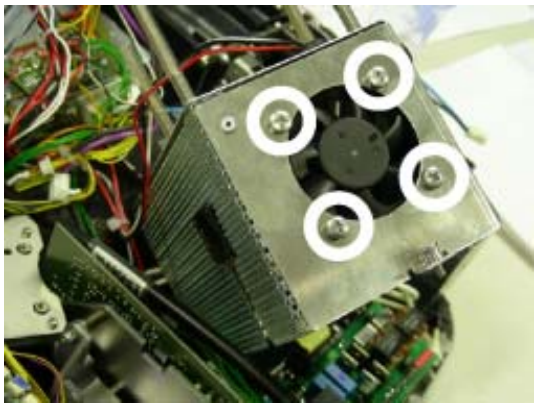


Image 7-27
Screws fixing the LPS fan to the LPS cover

4. Slide out the fan to remove it

7.3.6 Replacing the light pipe fan

Necessary tools

- screwdriver Philips Ph2
- screwdriver Torx T10

How to remove the light pipe fan?

1. Remove the power box — See "Replacing the power box", page 54
2. Remove both lamps — See "The UHP lamp", page 67
3. Remove the lamp top fans — See "Replacing the lamp top fans", page 92
4. Remove the lens holder — See "Removing the lens holder", page 99
5. Remove the three screws fixing the optical frame to the chassis

Image 7-28
Fixing screw of optical frame (next to lamp filters)

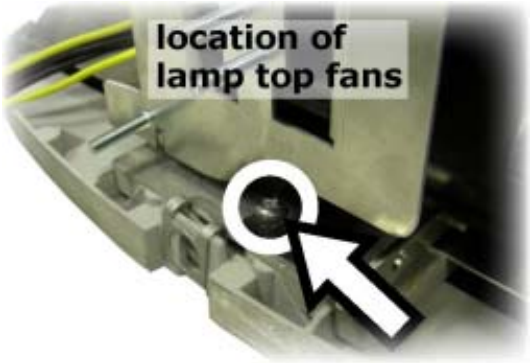


Image 7-29
Fixing screw of optical frame (rear side of projector)

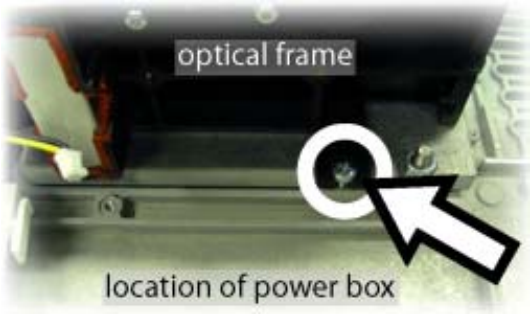


Image 7-30
Fixing screw of optical frame (next to power box)

6. Remove the light pipe fan connector (J31 on the small fan connector board on the bottom of the projector)

Image 7-31
Connector of the light pipe fan (between lamp and power box)

7. Remove connector J38 on the color wheel connection board

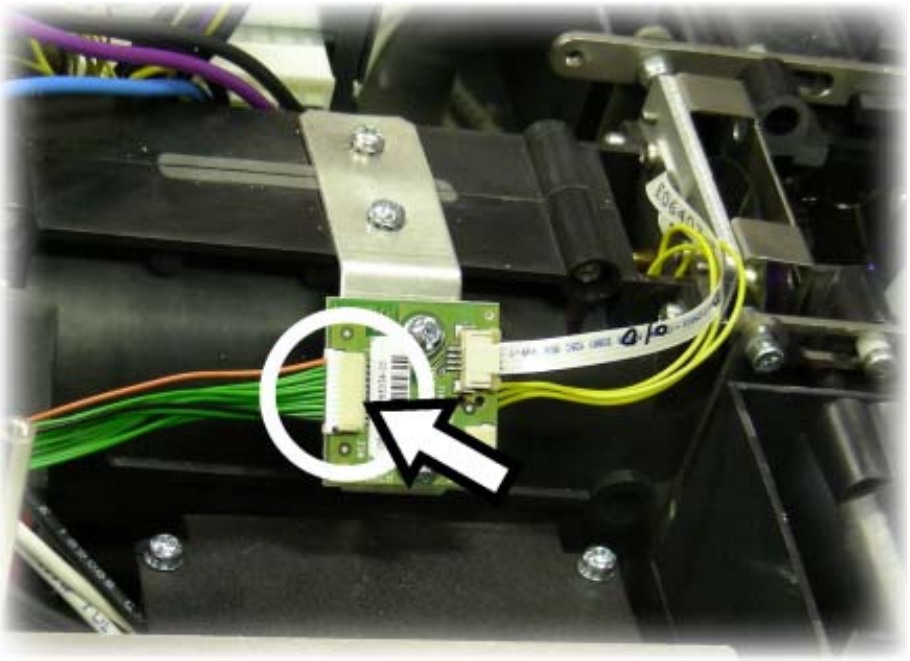


Image 7-32
Connector J38 on the color wheel connection board

8. Take out the optical frame by lifting it a bit en sliding it out
9. Remove the IR/UV filter — See"The UV/IR filter", page 69
10. Unscrew the four screws and remove the condenser lens behind the IR/UV filter

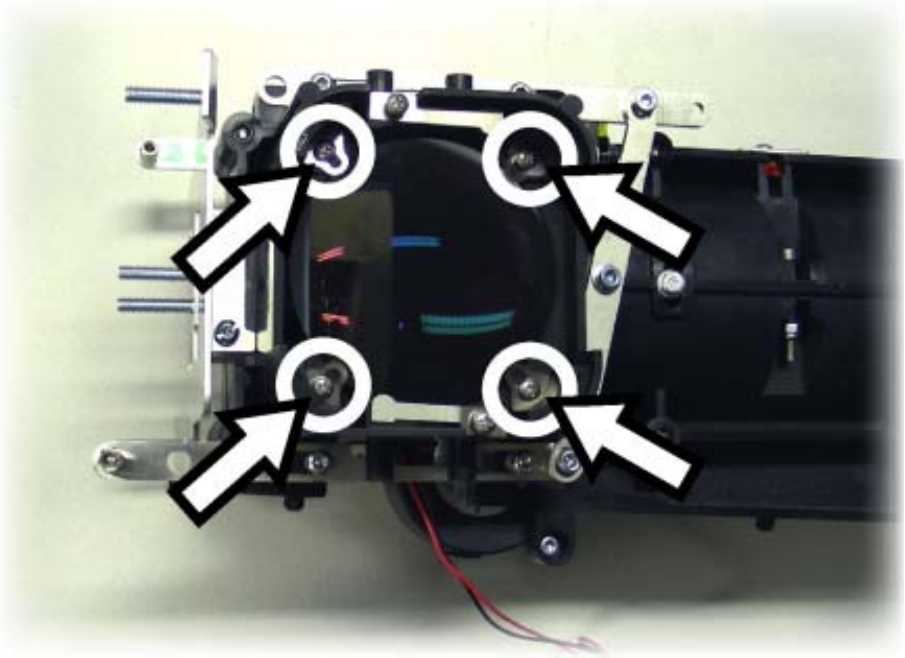


Image 7-33
Fixing screws of the condenser lens behind the UV/IR filter

11. Remove both screws fixing the light pipe fan to the optical frame

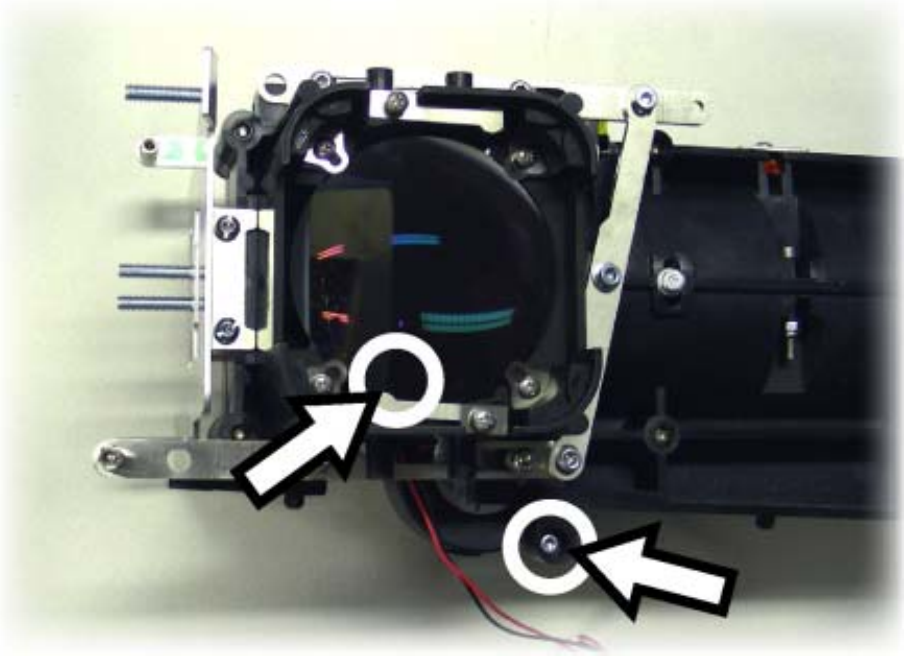


Image 7-34
Screws fixing the light pipe fan (the left screw is behind the condenser lens)

12. Remove the light pipe fan

7.3.7 Replacing the DMD fan

Necessary tools

screwdriver Torx T10

How to remove the DMD fan?

1. Remove the lens holder — See "Removing the lens holder", page 99
2. Unplug the connector of the fan (J4 on the fan connector board)
3. Remove the two screws fixing the DMD fan to the projector bottom

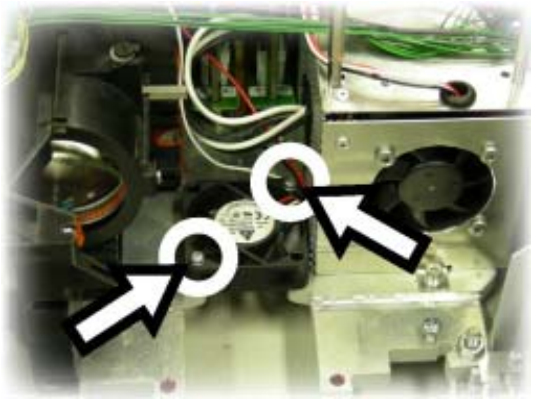


Image 7-35
Screws fixing the DMD fan (behind the lens holder, next to the LPS)

4. Remove the DMD fan

7.3.8 Replacing the PMP fan

Necessary tools

screwdriver Torx T10

How to remove the PMP fan?

1. Unplug the connector of the fan (J7 on the fan connector board)
2. Remove the 2 screws fixing the PMP fan

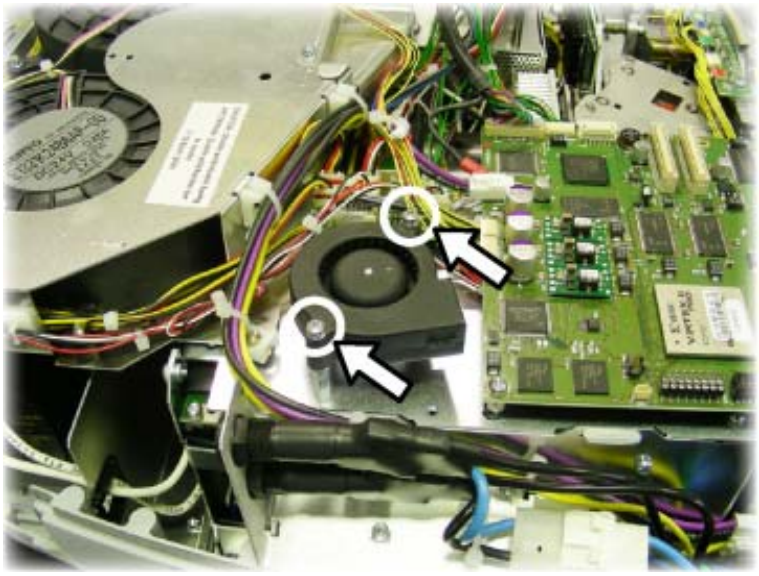


Image 7-36
Screws fixing the PMP fan

3. Remove the PMP fan

7.3.9 Temperature sensors

Ambient temperature sensor

The ambient temperature records the ambient temperature in the projector. Its feedback signal is used to control the fan speeds. It is located on the bottom of the projector, underneath the formatter board.

Image 7-37

Lamp temperature sensors

These sensors guard the lamp temperature: in case of overtemperature, the corresponding lamp will not be lit.

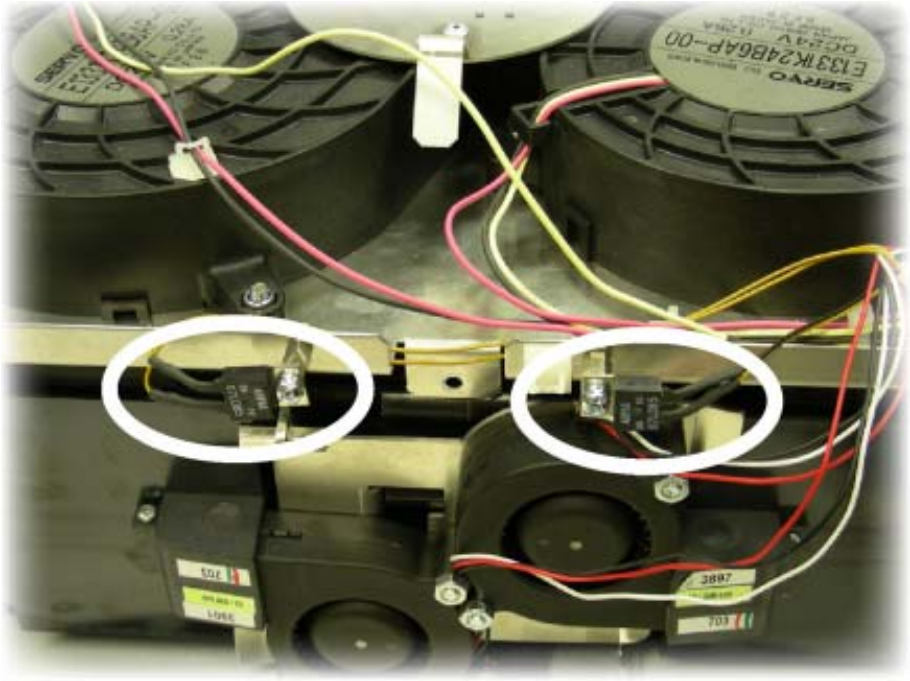


Image 7-38
Location of the **lamp temperature sensors**

DMD temperature sensor

This sensor records the temperature of the DMD chip.

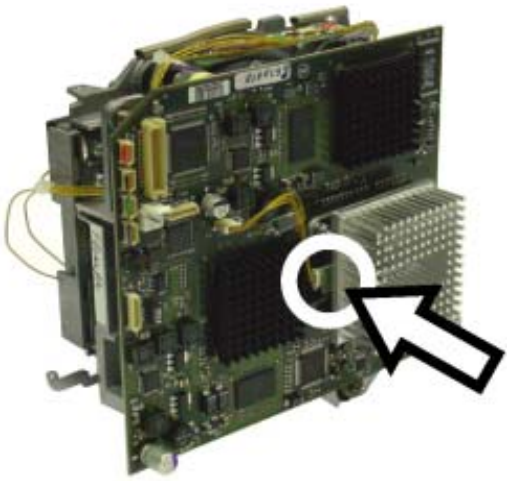


Image 7-39
Location of the temperature sensor of the DMD

7.4 The lens holder

7.4.1 Removing the lens holder

Necessary tools

- slotted screwdriver 4mm
- Philips 2 screwdriver
- Torx 10 screwdriver
- open ended spanner 8mm
- Allan key 2mm

How to remove the lens holder

1. Remove top and rear cover of the projector
2. Remove the PMP
3. Remove the input box
4. Remove the 7 screws, fixing the grid to the bottom side of the projector

Image 7-40
Screws of the filter cover

5. Remove the two screws fixing the lens holder to the frame on the bottom side of the projector

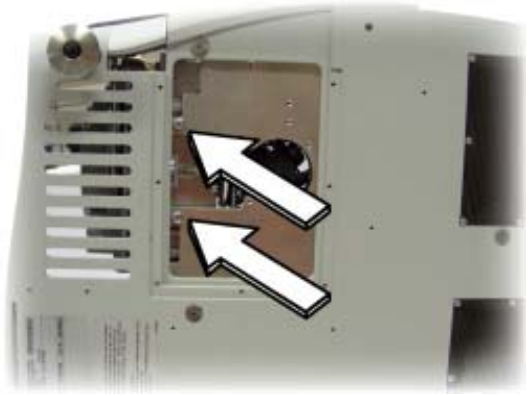


Image 7-41
Fixing screws of the lens holder

6. Remove the folding mirror — See "Removing the folding mirror", page 73
7. Gently lift the folding mirror to remove it. Do not touch the mirror part!
8. Loosen the screw holding the shaft of the lens locking handle system (only loosen it, do not remove it)

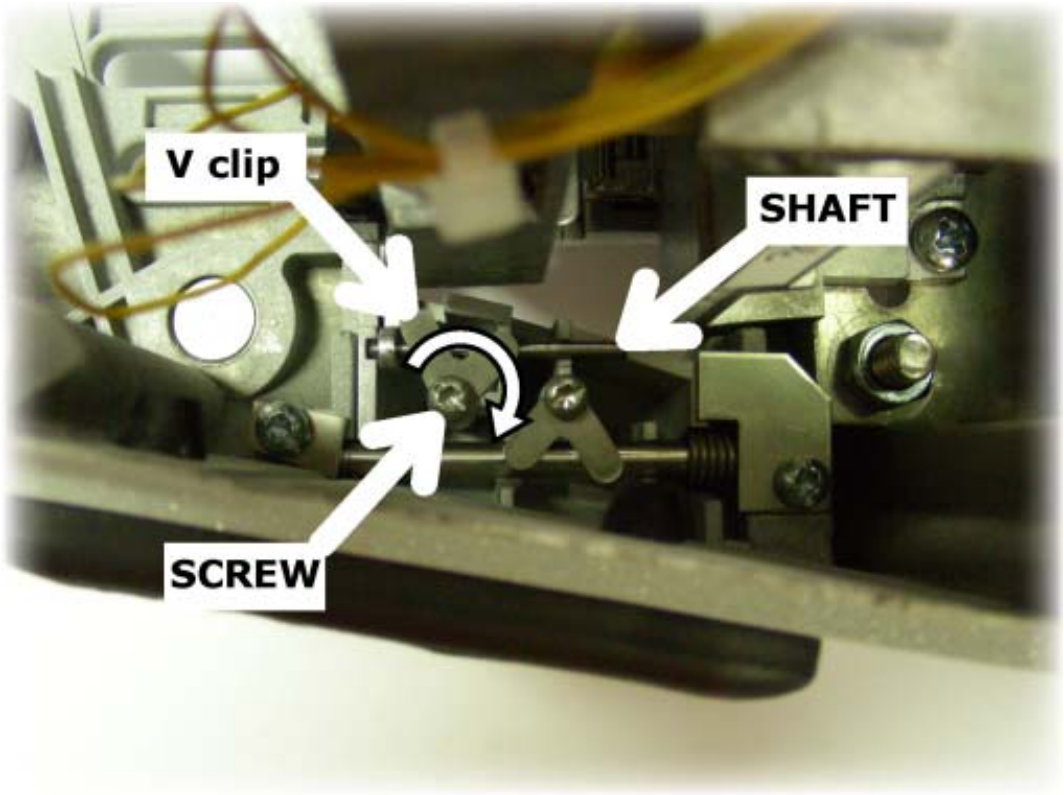


Image 7-42
Lens locking handle system on the right of the lens holder: screw, V clip and shaft

9. Turn the V-clip as to release the shaft of the lens locking handle system. See image 7-42
10. Slide out the shaft of the lens locking handle system. See image 7-42
11. Remove the two nuts and washers at the left side of the lens holder

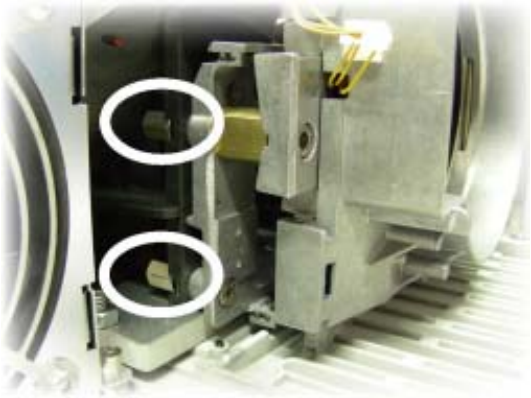


Image 7-43
Fixation nuts on left side of lens holder

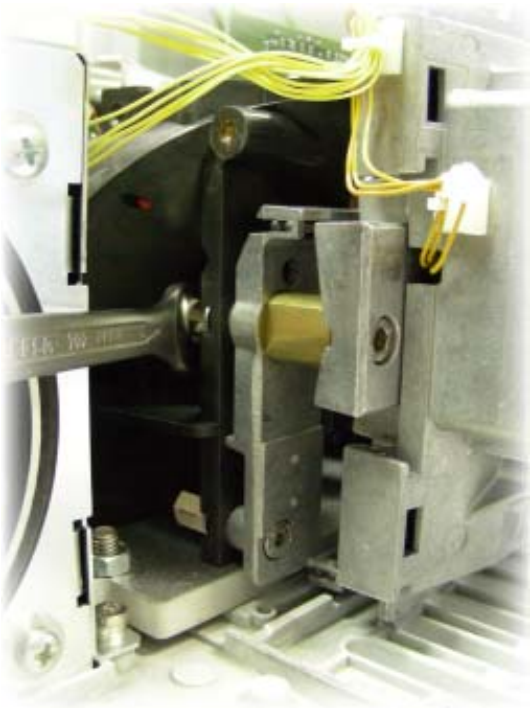


Image 7-44
Use an open ended spanner to remove the nuts

12. Release the wires from the lens holder

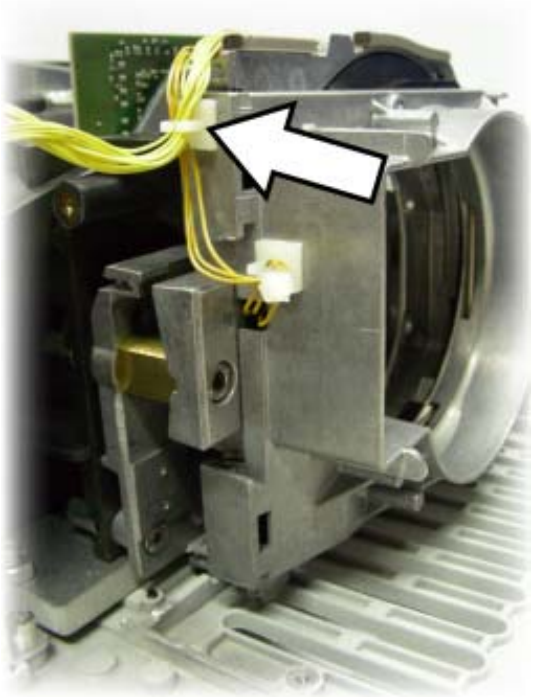


Image 7-45
Release the wires from the lens holder

13. Unplug the following connectors on the motor connector board:
- J239 (to 19 on the power box)
- J240 (to 20 on the power box)

Image 7-46
Unplug J239 and J249 on the motor connector board

14. Unplug the connectors on the formatter board:
    - J5 (to J38 on the color wheel connector board)
    - J8 (to CJ2 on the LPS)
    - J10 (to CJ2 on the LPS)
    - J9 (to 18 on the PB)
    - J11 (to 17 on the PB)
    - J1 (to J907 on the PMP)
    - J2 (to J915 on the PMP)
    - J4 (to 6 on the PB)

Image 7-47
Connectors J5, J8, J9, J10, J11 on the formatter board (part 1)

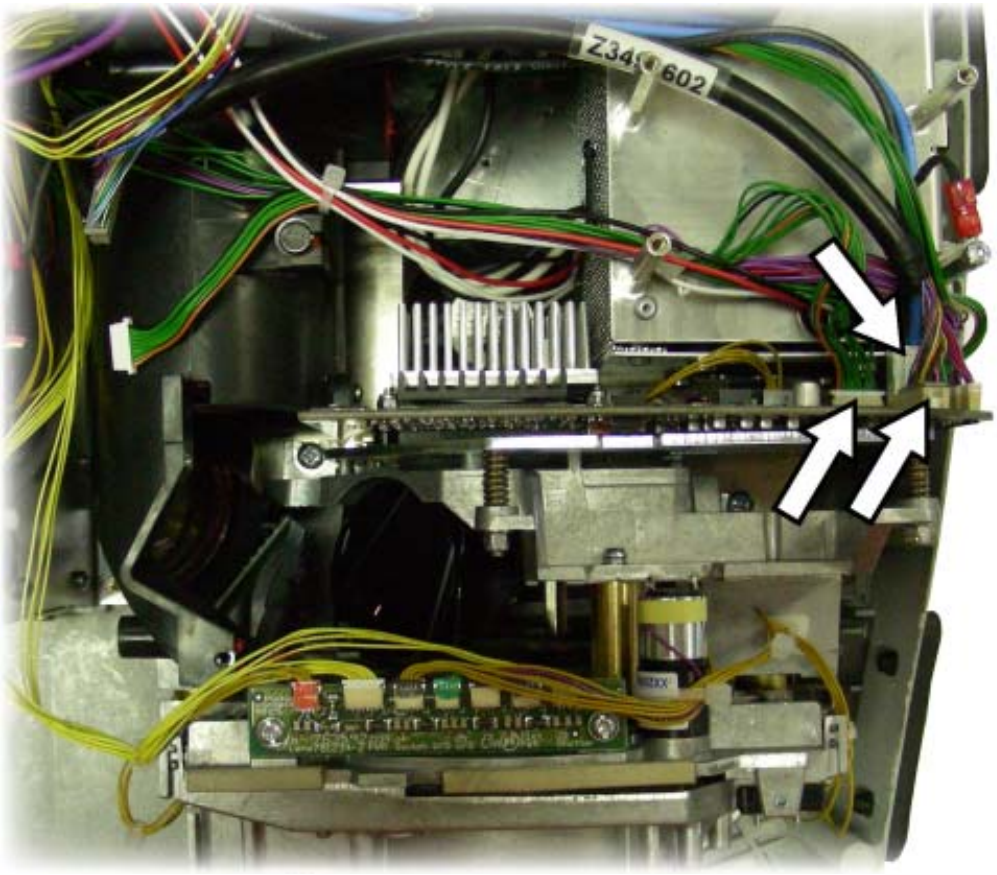


Image 7-48
Connectors J1, J2, J4 on the formatter (part 2)

15.Loosen the two screws fixing the lens holder to the bottom of the projector (loosen them, no need to remove them)

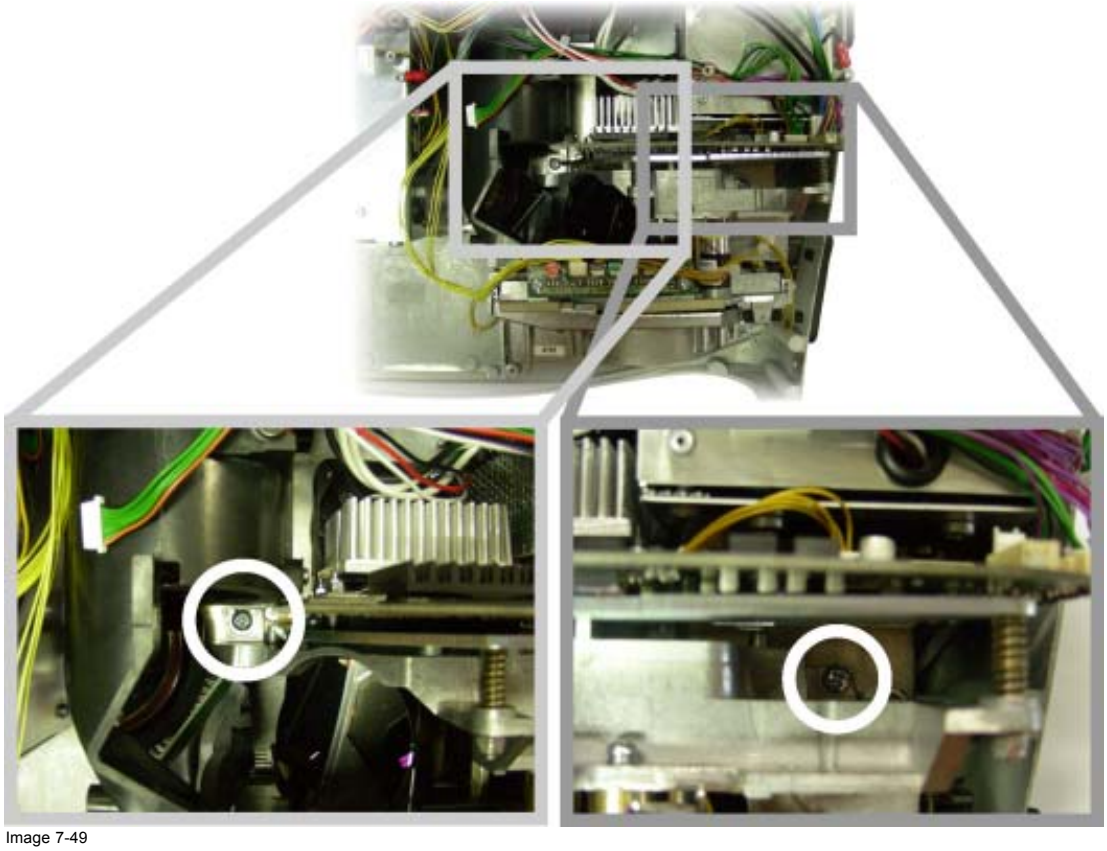


Image 7-49

16.Now you can remove the lens holder by gently sliding it a bit foward and lifting it out of the projector

Image 7-50
Lens holder: front side

7.5 Dust filters

Information

There are no dust filters to be cleaned!

Parts which are sensitive to dust are protected with seals.